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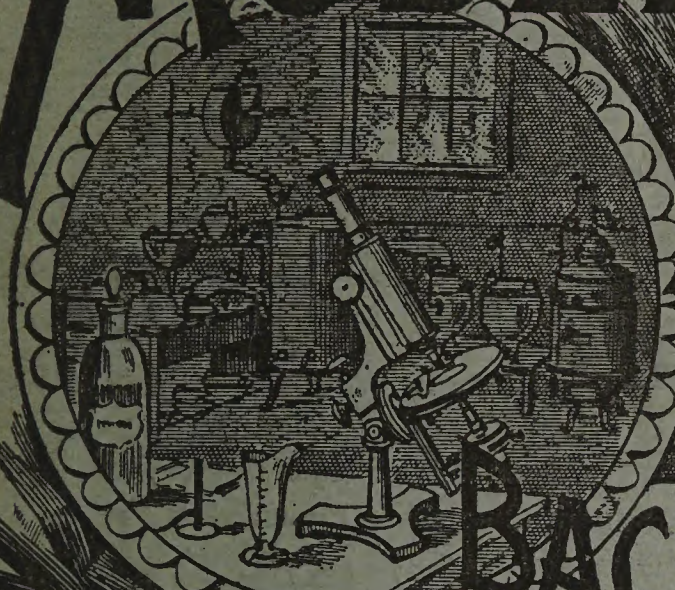
MODERN MEDICINE AND BACTERIOLOGICAL REVIEW.



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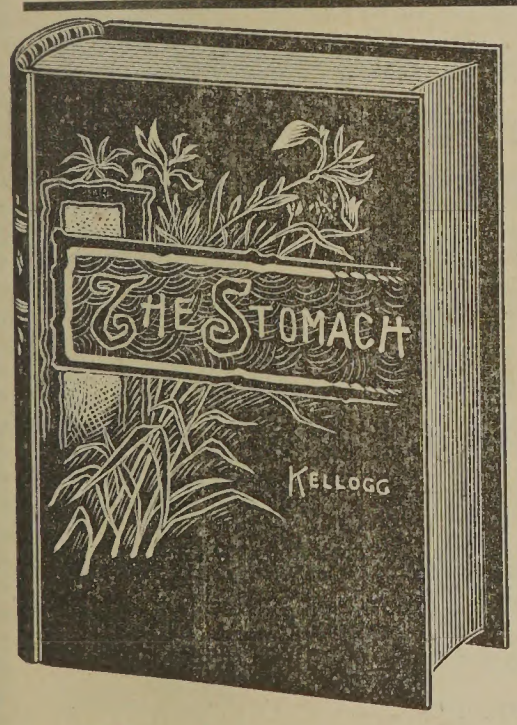

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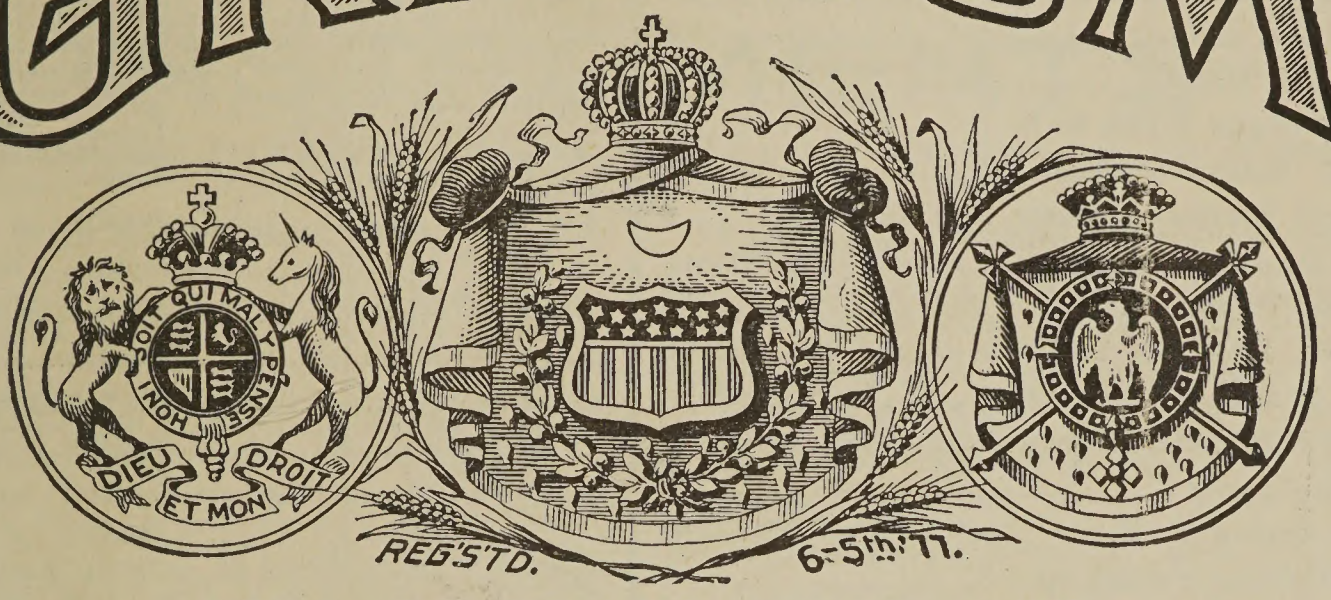

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11.25	5.05	10.30	6.00	.....	.....Valparaiso	5.05	11.35	7.10	.....	4.30
p m										
1.05	6.30	12.00	10.05	.....	.....South Bend.....	3.10	10.15	5.44	.....	3.07
1.46	7.12	12.45	12.40	.....	.....Cassopolis	2.15	9.40	5.13	.....	2.25
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2.44	7.55	1.48	4.30	a m	.....Vicksburg.....	1.10	8.52	....	p m	1.30
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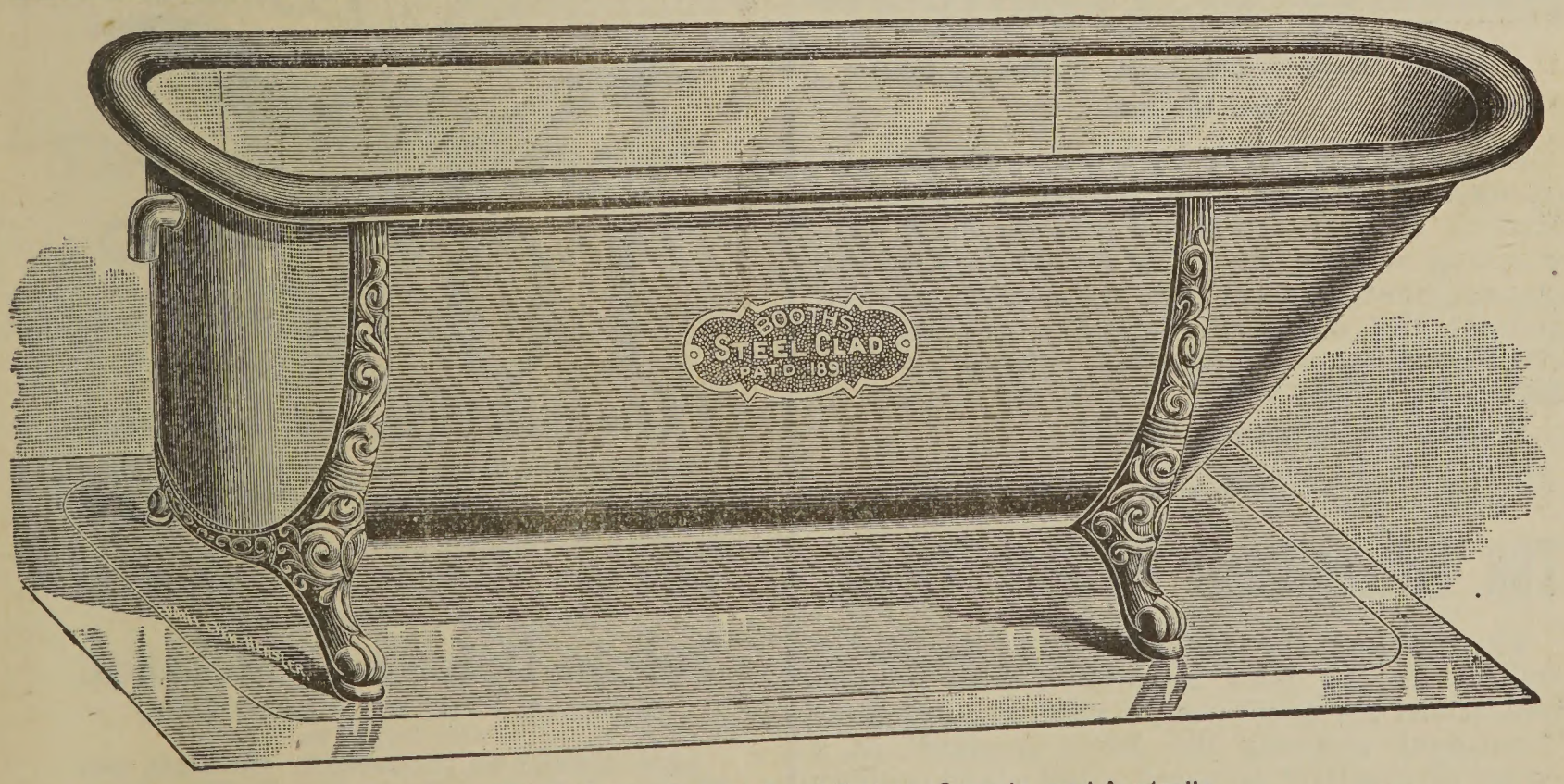

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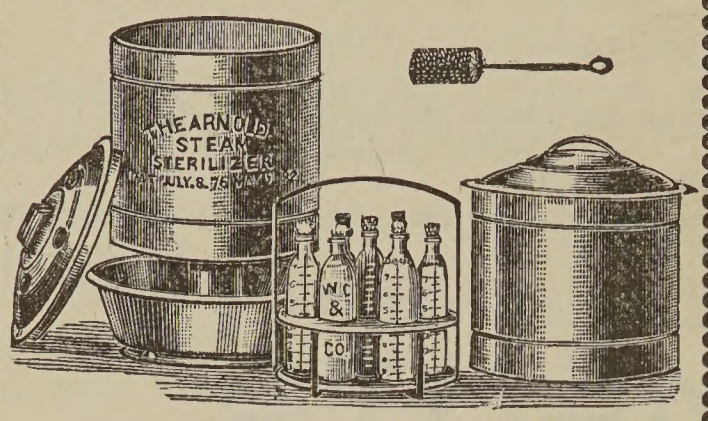

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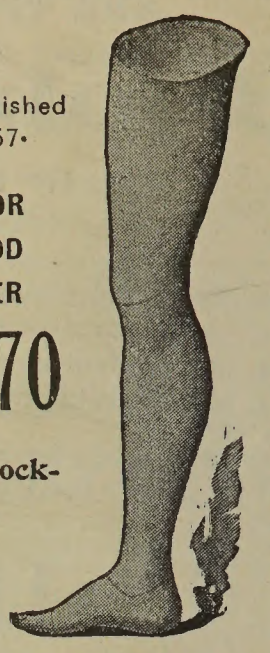

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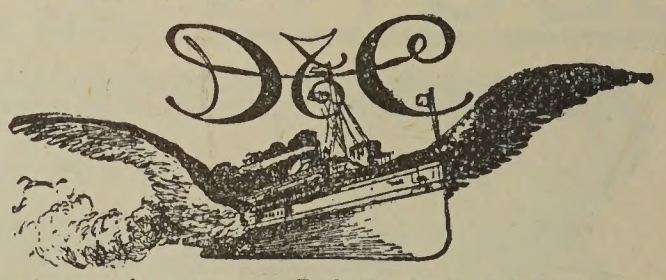

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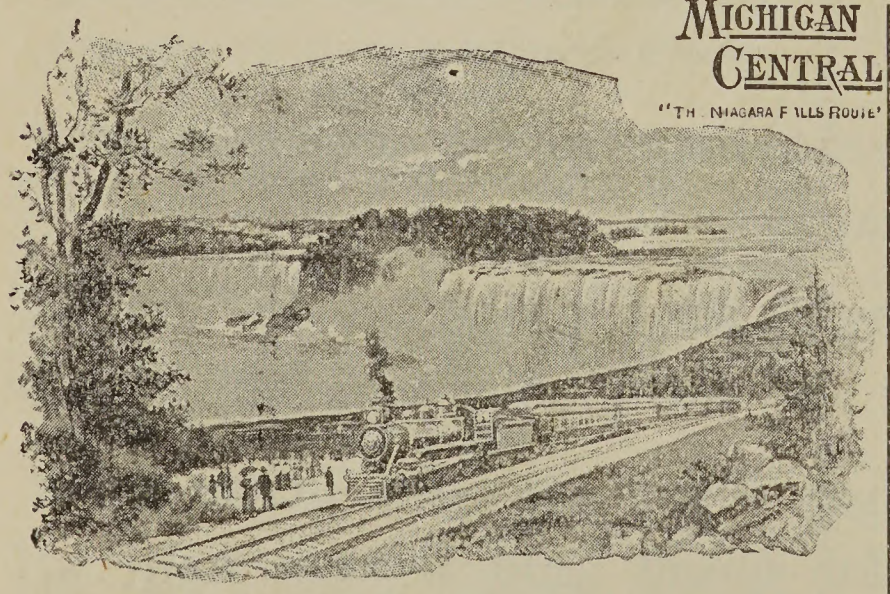

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MODERN MEDICINE

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BACTERIOLOGICAL REVIEW.

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ORIGINAL ARTICLES.

REPORT OF CASES ILLUSTRATING THE SUCCESSFUL TREATMENT OF SOME SEVERE FORMS OF NERVOUS DISEASES.

BY W. H. RILEY, M. D.,

Sanitarium, Battle Creek, Mich.

A NUMBER of cases have already been reported under the above head in a previous number of this journal. The purpose of reporting these cases is not to enter into a detailed description of any diseased conditions that may be illustrated by any of the cases here reported, nor to give a minute description of the methods of treatment of any particular disease, but rather to call attention to the value of the remedies themselves in the treatment of a large number of chronic nervous diseases.

It is coming to be more and more recognized by the best minds of the medical profession that hydrotherapy, electrotherapy, and massotherapy, with careful attention to the general nutrition of the patient and the proper use of rest and exercise, are not only the most rational but the most successful methods of treatment in that large and ever-increasing class of chronic disorders of the nervous and digestive systems. To be sure, materia medica still has a place in the healing art, but to the writer's mind it is not large in the treatment of such diseases as are illustrated by the cases reported below. The scientific use of heat, cold, electricity, massage, and other manual and mechanical manipulations, together with careful attention to nutrition by regulation of the diet, the correction of bad habits of living, and the establishment of a happy and contented frame of mind by pleasant surroundings and the removal as far as possible of that which would tend to irritate or annoy the patient either mentally or physically, — these measures, when properly applied, have proved, in the writer's experience, far more successful than medication in the treatment of such diseases as are illustrated in the following cases :—

CASE I.

Diagnosis. — Neurasthenia, with spinal irritation.

History. — The patient is a man forty-seven years old who has always enjoyed good health up to the beginning of his present trouble, which he thinks was caused by taking cold about ten weeks ago, when overheated. The first symptoms that he noticed were pain extending through his chest, trunk, and arms ; weakness and soreness in the arms ; numbness in the hands and feet ; and an uncomfortable feeling in the region of the heart. There was also tenderness and soreness along the spine. He has, at present, a feeling of general weakness and prostration, and tires easily when taking physical exercise or doing mental work. He also has disagreeable sensations about the head, and frontal headache which is more or less continuous, but not very severe in character. His circulation is poor, the extremities being usually cold. He takes cold easily, and is troubled with a cough.

Treatment. — The patient was placed under treatment consisting of an electric-light bath with massage twice a week ; fomentations to the spine, stomach, and liver, with general faradization twice a week ; fomentations to the spine, stomach, and liver, with massage twice a week ; the application of the galvanic current to the spine daily, a large electrode attached to the negative pole being applied over the abdomen, and the positive pole to the spine, with a current of

fifteen milliamperes. The application of mechanical Swedish movements and a graduated course of exercises also entered into the daily program of this case. This treatment was continued for a period of three weeks, at the end of which time the patient was entirely relieved of the pain and numbness in the upper extremities and chest. The symptoms of nerve exhaustion were almost completely gone, and the patient very much improved in every respect.

Case II.

Diagnosis.— Premonitory symptoms of paralysis of the right side of the body.

History.— The patient is a man forty-nine years old. He first came to the Sanitarium about eighteen months ago to be treated for hyperemia of the brain, with symptoms of threatened apoplexy. At this time he remained under treatment some weeks, and was entirely relieved of his distressing symptoms, and continued to feel well until about a month ago, when he experienced a sensation of numbness all through his body, and for a time had difficulty in speaking. He had had similar attacks previous to his first visit to the institution.

Examination showed a slight loss of sensation on the right side of the body and considerable loss of motor power. The knee-jerk and other reflexes in the right side of the body were increased. These symptoms affected all the right side of the body, including the face. At times his face was flushed, and he felt dizzy, and had symptoms pointing to hyperemia of the brain.

Treatment.— He was placed under treatment consisting of the use of hot blanket packs to his legs, warm leg baths, cold applications to the head, and the careful use of the galvanic current to the head, with massage. His digestion received careful attention, the bowels being regulated by diet and treatment, and all exercise carefully regulated and somewhat restricted. Under this program the patient continued treatment for about one month, at the end of which time the distressing symptoms were greatly relieved, and he returned home well satisfied with his stay at the institution.

Case III.

Diagnosis.— Neurasthenia, with insomnia.

History.— The patient is a banker, fifty-six years old, whose father died at the age of fifty-two years of pulmonary trouble. About two years ago the patient had what was called inflammation of the stomach. He thinks his trouble dates from that time. He came to the institution to be treated especially for his nervous and stomach troubles. His appetite is poor; he has indigestion, and is troubled with constipation of the bowels. He also has hemorrhoids. He does not sleep well. It takes him a long time to get to sleep after retiring, and he frequently awakens somewhere between one and two o'clock in the night, and does not sleep very much afterward. He has a constant feeling of exhaustion, which is most marked in the legs, and is increased by the slightest physical exercise. He also has a sensation of pressure downward in the top of the head. He is despondent, and worries much about his business.

Treatment.— The patient was placed under treatment consisting of the application of various measures in hydrotherapy, the use of massage, the general application of the faradic current to the body three times a week, and the galvanic current to the head and spine daily, the use of mechanical Swedish movements, and a graduated course of exercises. To relieve the insomnia, warm electric baths were given every night just before retiring. His diet was also carefully regulated, after first obtaining the chemical analysis of the contents of the stomach after a test breakfast.

The patient continued under treatment for about six weeks, and at the end of this time his appetite was good, his digestion was much improved, he had gained several pounds in weight, was sleeping well without the use of any hypnotic, and had gained much in strength, as was shown by a careful test of the strength of the muscles taken at the beginning and again at the end of treatment.

Case IV.

Diagnosis.— Chorea.

History.— The patient is a boy ten years old. His father is of a nervous temperament, and his mother not very strong. The boy has never been rugged. The mother thinks that his present trouble was caused by an attack of la grippe three years ago. About eighteen months ago

he began to have choreic movements in the muscles of the neck and chest, producing jerky movements of the head and shoulders. These choreic movements have continued with little or no change up to the present time, though the father thinks they have been getting worse during the past two or three weeks. These movements affect the head and neck, the upper extremities, and the muscles of the chest, and are present nearly all the time except during sleep. The patient is troubled with shortness of breath, is pale and anemic, his appetite is not very good, his digestion is impaired, bowels constipated, and he has a dry cough. At times he has a pain in the right side in the region of the heart. The action of the heart is weak and rather irritable. The reflexes, both deep and superficial, are present, and apparently normal.

Treatment.— This patient was placed under treatment consisting of a hot blanket pack applied to the entire body, followed by massage every other day, a warm electric bath twice a week, alternate applications of heat and cold to the spine, with the faradic current applied to the body generally once a week. The diet was carefully regulated, the patient not being allowed to eat any meat nor stimulating food; his exercise was also restricted, and allowed in only very moderate degree. The patient made rapid improvement almost from the beginning of treatment. The above program was continued, with slight modifications as symptoms seemed to indicate, and at the end of two months the choreic movements were entirely absent nearly all the time, showing themselves only at intervals of two or three weeks, and then being slight, barely suggestive of his previous serious trouble.

Case V.

Diagnosis.— Indigestion with weak heart, constipation.

History.— The patient is a man thirty-six years old, whose trouble began about five months ago with pain in the region of the heart. He has also suffered a great deal from palpitation of the heart, which is apt to manifest itself most prominently in the latter part of the day or three or four hours after eating. His appetite is variable, digestion much disturbed, and bowels almost constantly constipated. He has hemorrhoids. He has been in the habit of smoking a great deal.

Physical examination shows that the muscles of the body are rather soft and flabby, with muscular strength rather below the normal; heart is weak and irregular, stomach somewhat prolapsed, with its muscular coats evidently relaxed and weak. The reflexes, both deep and superficial, are present, and apparently normal. With the exception of slight paresthesia in the feet and hands, there is no disturbance of sensation.

Treatment.— This patient was placed under treatment consisting of the use of hydrotherapy, the faradic current of electricity, massage, and a graduated course of exercises. The diet was carefully regulated, and the use of tobacco entirely prohibited. Continuing along these lines of treatment for a period of about five weeks, the patient made rapid improvement, his digestion was very much better, the heart action stronger, palpitation having entirely disappeared, and he had gained very much in strength. He left the institution practically relieved of the troubles for which he came.

Case VI.

Diagnosis.— Chronic articular rheumatism.

History.— This patient was a man fifty-four years old. He had rheumatism in the army in 1862, and has suffered with it more or less since; has not been able to work for the last five or six years, and for the past six months has not been able to get his clothes on and off without help. The rheumatism has affected the joints of the arms and legs, and has produced swelling and deformity in some of the joints. He is very thin in flesh, and suffers more or less with rheumatic pains in different parts of the body.

Treatment.— He was placed under treatment consisting of the application of hot fomentations to the affected joints, the use of the electric-light and warm electric baths, massage, and the application of galvanism to the joints, with as strong a current as he could bear. The diet was also carefully regulated, and the patient was instructed to drink large quantities of water between meals.

The patient's condition improved rapidly under this treatment, and he was soon able to walk with the aid of two crutches, and a few weeks later to dis-

pense with their use entirely, getting about with one cane. After being under treatment for about two and one-half months, he was able to walk without the use of any support. He said he was better than he had been for twenty-five years, and went home delighted with his improvement. A letter received from the patient something like a year after his return home, states that he is still enjoying good health, and that the rheumatism has not given him any special trouble.

Considering the fact that this case was of more than thirty years' standing, and that it had prevented the patient from doing any physical work for six years, the case is certainly one of unusual interest, and illustrates very forcibly what can be accomplished in these cases by the persistent use of such remedies as were used.

Case VII.

Diagnosis.— Partial paralysis of the right side of the body, caused by cerebral lesion.

History.— The patient had always enjoyed good health previous to his present trouble, which began about six months ago. He had some premonitory symptoms before the present attack developed, consisting of a feeling of numbness in the right hand, and finally an entire inability to write with it a short time before the attack developed. With these exceptions, the present apoplectic attack developed suddenly. As the result of the stroke, he was paralyzed in the right arm and leg. He was confined to his bed for three and one-half months, during which time the right arm and leg were either completely paralyzed or nearly so. About the time he got out of bed he began to improve, and has been improving slowly ever since. At the present time he is able to walk by the aid of a cane, and uses his right arm some. There is very little, if any, loss of sensation on the right side of the body. He complains some of numbness in the right leg and arm. The knee-jerk in both limbs is increased, but much more so in the right than in the left. There is no ankle clonus. At the beginning of his present trouble he had aphasia. The difficulty with his speech at the present time may be properly expressed by the term "paraphasia," that is, he misplaces words, and calls things by the wrong names. He has more or less vertigo, quite pronounced in the morning. He is partially deaf in both ears. The right ear became affected at the time of his stroke of paralysis. His appetite is good, digestion fair, and bowels regular.

Treatment.— The indications for the treatment of this class of cases may be considered under the following heads: —

1. To prevent the occurrence of other attacks.
2. To diminish the amount of blood in the brain, and reduce the blood pressure within the cerebral arteries.
3. To remove, if possible, the pathological lesion.
4. To restore the function of the paralyzed muscles.

The writer believes that these indications for treatment are best met by the proper use of hydrotherapy, massage, and electricity, together with a carefully regulated diet, and the restriction and regulation of the exercise. Besides these remedies, the use of bromide of potassium taken internally in the early stages of the disease, followed later by the use of potassium iodide in free doses, seems to be of some help in the treatment of these cases.

Under this treatment, in one month's time the patient was very much improved. He had better use of the lower limbs in walking, and could use his arm very much better than when he came. A comparison of the strength of the muscles at the time of leaving off treatment with that when he began shows a decided gain in muscular power.

Case VIII.

Diagnosis.— Sciatica.

History.— The patient is a man eighty years old, who has usually enjoyed good health, never having had any severe illness. About ten years ago he began to have severe pains along the course of the sciatic nerve in the right hip and leg. After a time he recovered from this attack, and has not since been troubled with it until about four months ago, when he had another attack. He came to the Sanitarium especially to be treated for this sciatic trouble. Besides this he has some indigestion, sourness of the stomach and gas on the stomach, with irritation of the rectum; he has cold hands and feet; there is tenderness along the course of the right sciatic nerve; the

right limb is weaker than the left, and the muscles somewhat soft and shrunken.

Treatment.— He was placed under treatment consisting of a continuous application of heat to the right sciatic nerve for one hour twice daily. The galvanic current was also applied along the course of the sciatic nerve, a large electrode attached to a negative pole being used, and applied over the abdomen, while the positive electrode was applied along the course of the sciatic nerve. A current of about twenty milliamperes was employed, and applied daily for twenty minutes at each séance. He was also placed on a course of tonic treatment to improve his general health and digestion.

The patient continued this treatment for about one month, at the end of which time he was entirely relieved of the trouble for which he came to the institution.

Case IX.

Diagnosis.— Paresthesia in the extremities, neuralgia of the stomach.

History.— The patient had the grippe about eight or nine months ago, since which time he has had pain in different parts of the body and a peculiar feeling of numbness in his hands, arms, feet, and legs. He also has considerable pain in the stomach, accompanied by indigestion. Recently he has been drinking alcoholic liquors to relieve the pain in the stomach. He came to the Sanitarium to receive treatment for these troubles.

Treatment.— The pain and paresthesia in the extremities were successfully treated by the alternate application of a hot and cold spray to the extremities, the hot water being first applied as warm as the patient could comfortably bear it for a period of two minutes, and followed by the cool spray at a temperature of sixty degrees for one minute. The heat and cold was alternated in this way, the application being continued for ten minutes at each séance, and applied twice a day. Besides this, the galvanic current was applied to the extremities and the spine, the positive pole being used over the seat of pain and paresthesia, while the negative pole was employed at some indifferent point, as over the abdomen. By using the large electrode attached to the negative pole and applied at some indifferent point of the body, the resistance in the circuit is considerably diminished, and the patient consequently able to bear a stronger current, the effect of which is intensified in the region of the positive electrode, where it is most needed, the positive electrode being applied over the seat of the sensory disturbance in the arms and legs. In addition to this treatment, the patient received massage, with general application of the faradic current to tone up the muscles of the body generally. The use of all alcoholic liquors as well as tobacco was strictly prohibited; the habits of the patient as to time of meals, articles of food eaten, exercise, rest, etc., were all carefully regulated. Under this regimen the patient improved rapidly, and at the end of one month's time he was entirely relieved of the distressing symptoms for which he came for treatment.

Case X.

Diagnosis.— Nerve exhaustion, indigestion, mental depression.

History.— The patient is a man fifty-eight years of age; has been in active business for the past twenty years. During the last two years he has worried a great deal about business matters, has been mentally depressed, and has not slept well. To produce sleep he has been taking hypnotics. He has been exceedingly nervous, having a constant feeling of fatigue, which is increased by very moderate physical exercise or mental work. He has used alcoholic liquors to some extent, but not for the past two years. His appetite is fairly good, but he complains of being bilious at times. He thinks his liver is torpid; his bowels are constipated, and he is troubled with indigestion. He has shortness of breath, and takes cold easily. He has a confused, and constricted feeling across his forehead; a dull, heavy, aching pain in the occipital region of the head, and a pressure downward on the top of the head. These pains in the head are as a rule increased by exercise. He has difficulty in getting to sleep when he retires, and usually wakes up between twelve and two o'clock, and sleeps but little afterward. He says he usually sleeps only from two to six hours out of the twenty-four. He wakes in the morning unrefreshed, and as a rule feels worse in the morning than at any other time in the day. He is morbid, and apprehensive about his mental con-

dition, and is afraid that he will lose his mind. He has been under treatment with drugs for the past two years by various physicians, but has made no improvement.

Treatment.— The patient was placed under treatment as follows: In the morning on rising, he was given a salt bath followed by a brisk rub all over the body and special massage to the bowels. Later in the day, when the pains in his head were at their worst, the galvanic current was applied to his head and spine, a current of from five to eight milliamperes being used to the head and one of fifteen to twenty to the spine. The current was applied for fifteen minutes daily. A careful test was taken of his muscular strength, and he was placed on a graduated course of exercise. In the evening his treatment consisted of a warm electric bath, followed by massage. The purpose of giving this treatment at this time of day was to induce sleep.

The patient made very rapid improvement almost from the first. In two weeks' time he was sleeping well, and had gained some in flesh. The distressing symptoms in his head gradually disappeared; he became more cheerful, his fears about himself gradually fading away; and in a short time he was well on the way to health. He continued under treatment for two months, at the end of which time he was entirely relieved of all his troubles, had gained twenty-five pounds in flesh and very much in strength. His appearance had entirely changed from that of a person who is pale and anemic from loss of sleep to that of a person in good health, with a ruddy complexion. He left the institution delighted with his improvement, and feeling that the treatment he had received had saved his life, and kept him from the insane asylum.

He returned home and resumed his duties in an important position in one of our principal railroad systems. In a letter received from him a year later he reports himself enjoying the very best of health, and able to attend to his business.

(To be continued.)

MECHANICAL EXERCISE.

BY J. H. KELLOGG, M. D.

(Continued.)

MECHANICAL kneading of the arms is executed by means of the apparatus shown in Fig. 9. When the pressure is made sufficient to prevent the rubbers from slipping over the surface, the movement is that of rolling, a form of deep kneading; with lighter pressure, it is that of friction. This is a valuable mode of utilizing mechanical massage. The time of application is from three to five minutes.

The legs may receive mechanical massage by means of a similar apparatus, shown in Fig. 10. This is an excellent means of aiding the circulation in cases in which the legs and feet are habitually cold. The application should be continued from five to eight minutes, or until the extremities are thoroughly warmed.

Mechanical kneading of various parts may be employed, as is also shown in Fig. 9. The apparatus utilized is similar to that used for rotary vibration of the feet. A suitable pad is secured at the end of a bar, which is made to rotate while it rests against any portion of the trunk to which it can be conveniently applied. It is especially useful in making applications to the back, stomach, bowels, shoulders, and the region of the liver. In cases of gallstones, it is a most excellent means of jostling imbedded calculi down into the bile duct, thereby hastening the emptying of the gall-bladder. It also facilitates the discharge of the fluid contents of the gall-bladder, and is thus a valuable aid to digestion. It will be apparent from these observations that this particular form of apparatus is a very efficient form of vibration, as well as a thorough kneading procedure. The time of application should be from one to three minutes to each part.

Trunk Rolling.— The apparatus represented in use in Fig. 11, consists of a pair of pulleys moving in alternation and in opposite directions, a fraction of a revolution in each direction. To each pulley is attached one end of a broad strap, which is passed around the trunk in such a manner that, as the strap is pulled first in one direction and then in the opposite, the tissues are acted upon very much as in certain forms of palmar kneading. When applied about the waist, it is a very excellent means of administering a rolling movement to the muscles of the trunk, and a shaking movement to the viscera; when applied across the shoulders, the effect is that of deep kneading. This is a favorite apparatus with patients who are under treatment by mechanical massage.

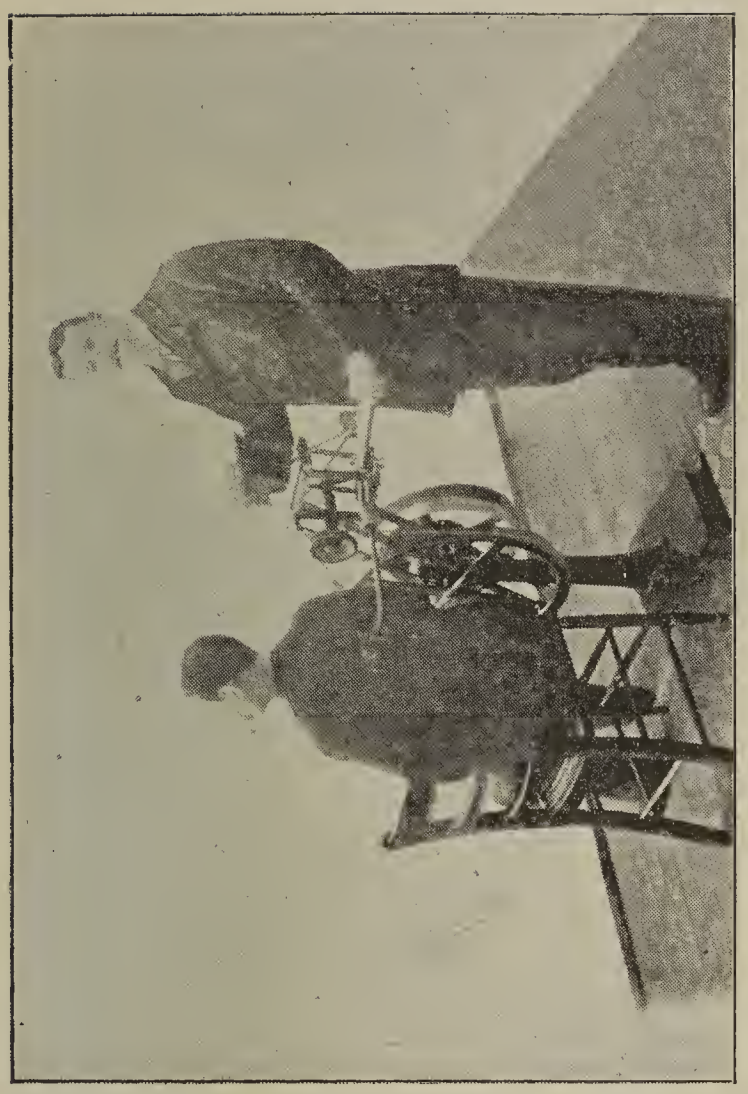

Fig. 9.— Apparatus for Kneading the Arms.

Fig. 10 — Apparatus for Kneading the Legs.

Fig. 11.— Trunk Rolling.

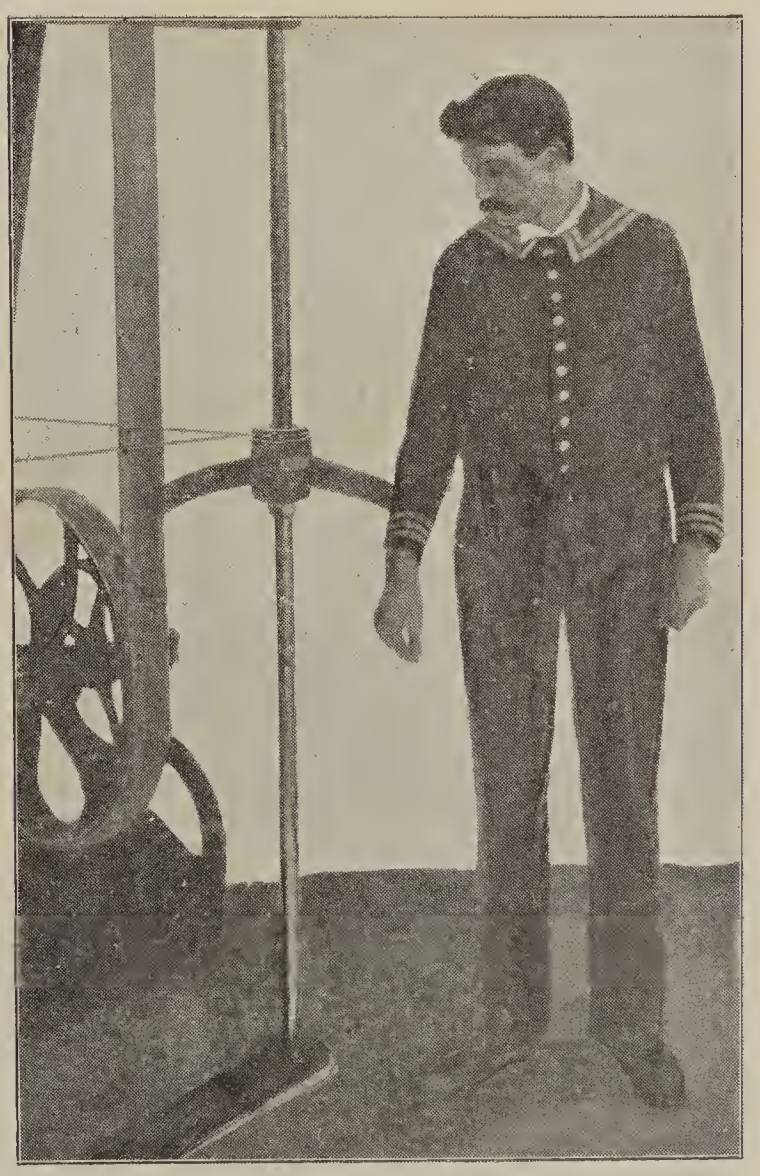

Fig. 12.— Apparatus for Mechanical Percussion

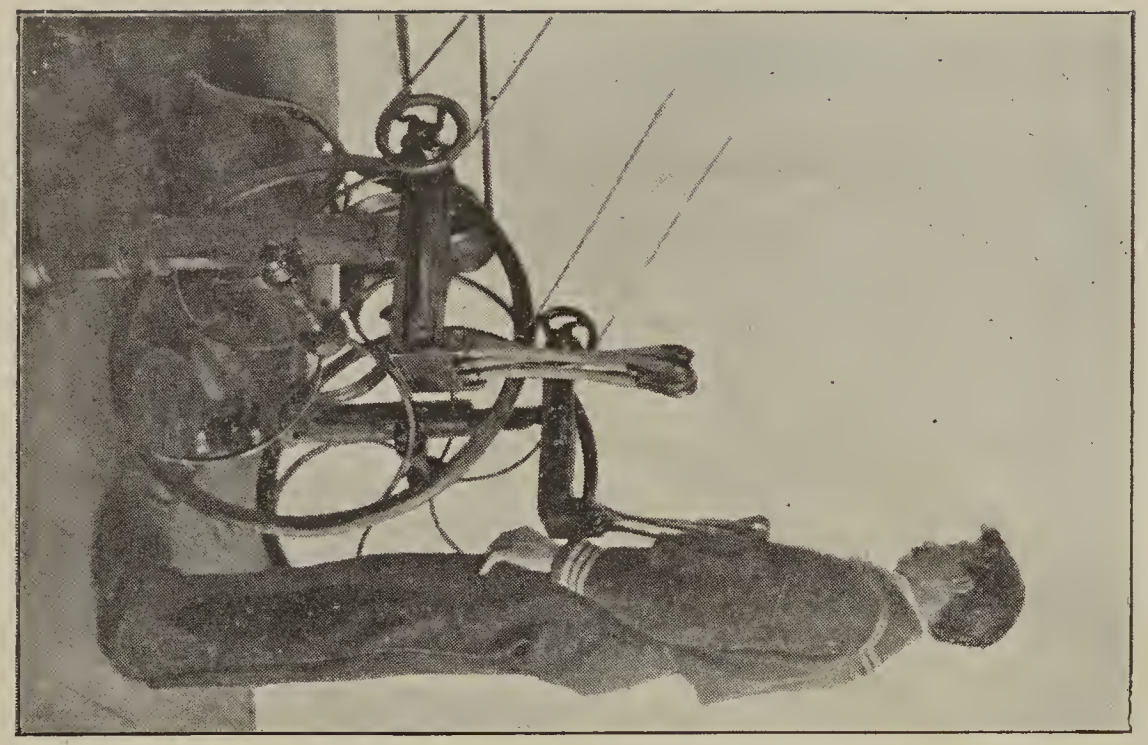

Fig. 13.—Beating Apparatus

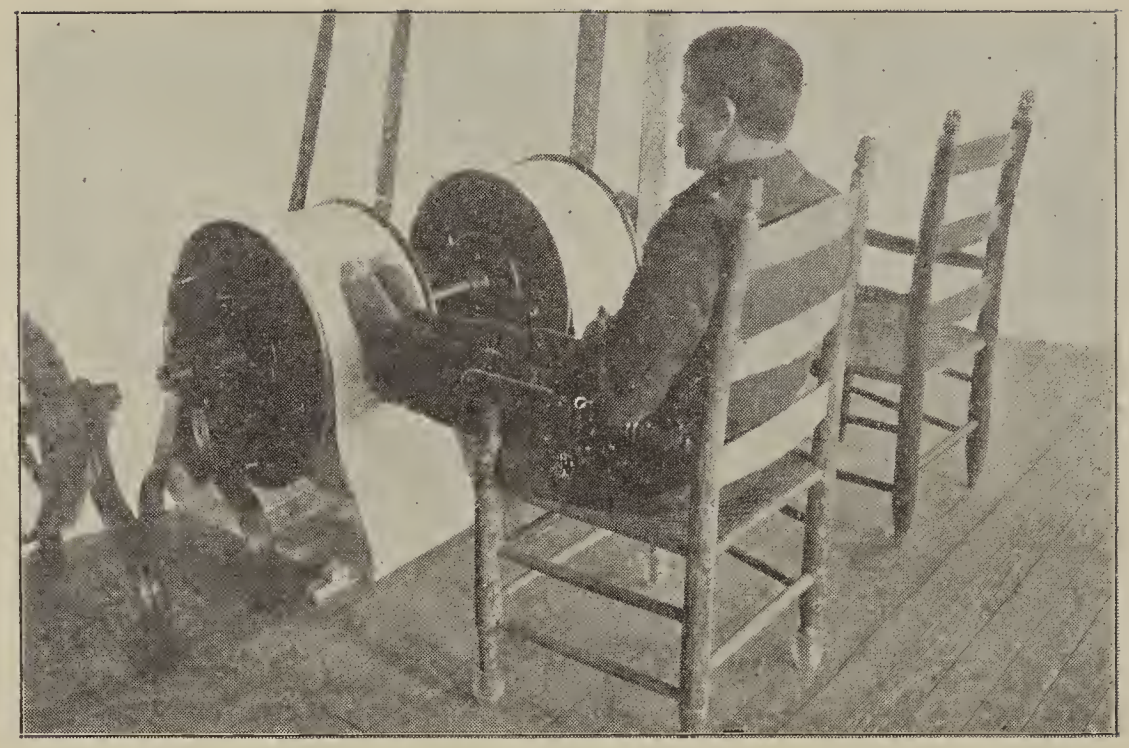

Fig. 14 —Mechanical Friction of the Feet.

F.G. 15 — Tilting-Table.

Fig. 16.—Pelvis-Tilting.

It was devised by the author about ten years ago. This application is so vigorous that it is not usually continued more than two to four minutes.

Mechanical Percussion.— There are two forms of percussion which may be administered mechanically; viz., (1) slapping; (2) beating.

Slapping is administered mechanically by means of a vertical revolving bar, to which is attached a broad strap about sixteen inches in length (Fig. 12). The strap is fastened to the bar at its middle, the two ends being free; and thus two blows are struck at each revolution. Different degrees of force are secured by modifications of the speed with which the bar is made to revolve, the thickness of the strap, and the position of the patient in relation to the bar and the strap. The time of the application is one to three minutes.

Mechanical slapping is a most effective measure for stimulating the surface circulation. In this respect it is not excelled by any procedure which can be administered by the hand. It is most usefully applied to the shoulders and back, the legs and thighs, and the soles of the feet.

Mechanical Beating (Fig. 13) is an efficient mode of percussion, though less valuable in comparison with beating administered by the hand than is mechanical percussion in comparison with manual percussion. It is most effectively applied to the spine and chest, and over the abdomen. The apparatus shown was devised simultaneously by the writer and by Zander, of Stockholm. The usual time of application is from two to four minutes.

Mechanical Friction.— Friction may be applied to the soles of the feet by a revolving ribbed cylinder (Fig. 14), which was first used by Zander. The writer has added a number of features which have proved serviceable. One of these is the employment of an apron to cover the ribs of the revolving cylinder, thus preventing the wearing upon the patient's stockings or slippers; another improvement is the insulation of the chair in which the patient sits, which I was led to make by noticing that sparks could often be drawn from different parts of the patient's body while receiving treatment from the apparatus. It is not an uncommon thing to see the hair of a patient sitting in the insulated seat, erected by the electric charge generated by the friction of the machine. It is possible that a certain portion of the static electricity may be generated by the driving belt. This phenomenon is of course chiefly confined to the colder months, when the atmosphere is dry.

The apparatus is a very valuable one, as it performs its work efficiently, and does something which cannot be so well accomplished in any other way. It is a favorite machine with our patients. The application is a very agreeable one, and may be continued almost *ad libitum* without injury. The usual time is from five to ten minutes.

Tilting Table.— In Fig. 15 is represented a tilting table, which the writer devised nearly twelve years ago, and has had in use since. The patient lies upon his back while one end of the table-top is lifted by means of a large cam operating beneath it. The patient lies with his head at the stationary end of the table.

The purpose of this apparatus is to secure what I have termed "vasomotor gymnastics." When the hand is raised above the head, a strong contraction of its blood-vessels occurs, the effect being rendered visible to the eye by blanching of the skin. At the same time that the blood-vessels of the arm are thus made to contract by a vasomotor reflex, the vessels of the corresponding portion of the brain also contract. By a repetition of the movement, real gymnastics of the muscular walls of the vessels may be executed, and thus relaxed vessels be contracted and strengthened, and local congestion relieved, if so situated as to come within the sphere of the reflex action set up by the change in the position of the arm.

The same principle applies with equal force to the lower extremities, which have a relation to the organs of the pelvis similar to that which the arms sustain to the brain. Leg-raising, with the patient lying in a horizontal position, is one of the recognized and most valuable movements in the medical gymnastics of the Swedes. There is, however, a certain disadvantage in this mode of exciting vascular contraction. It is impossible to raise a limb by voluntary effort without a certain degree of strain, which involves holding the breath, and producing, as a result, an increase of pelvic and portal congestion, so that the exercise must to some degree defeat its own purpose. In

this exercise, also, but one leg is raised at once. When the lower part of the body is elevated mechanically, there is no exertion on the part of the patient, consequently no strain, and both limbs are elevated at the same time; thus the maximum effect is obtained.

This apparatus is of great service in all forms of pelvic congestion, in ovarian disease, uterine catarrh, displacements of the pelvic viscera, and in rectal disease of various forms. After spending a few minutes upon the tilting table, rising and falling with its oscillations at the rate of about eight times a minute, patients suffering from the maladies named and others similar, almost invariably express themselves as experiencing a marked sense of relief. The effects of this mode of passive exercise of the blood-vessels are so agreeable that patients are inclined to continue the application as long as they are allowed to do so. As a rule, ten to fifteen minutes will secure decided physiological effects.

Pelvis Tilting.— Nearly all forms of pelvic disease give indications for the use of the tilting table above described. In displacement of the womb or ovaries, however, as well as of the stomach, liver, kidneys, bowels, and other abdominal organs, it is important to combine with the vasomotor gymnastics described, the employment of position as an aid to restoration of the displaced viscera. This is accomplished by adding to the tilting table above described a device by means of which the pelvis is lifted free from the table while the patient lies upon the face, thus causing the abdominal wall to sag downward (Fig. 16). As the table is tilted, the patient is lifted into such a position as to cause gravity to make an upward (in relation to the normal position) pull upon the viscera of the trunk. The device consists simply of an attachment placed in the center of the table, which is made to rise more rapidly than the table itself, thus lifting the pelvis before the rest of the body, and holding it in this relation until the table returns to a state of rest. The effect of this apparatus is increased, if, while the patient is elevated, the attendant applies percussion or beating to the sacral region.

The use of this apparatus alone is not sufficient to restore displaced organs to position, but it aids greatly in relieving congestion, and is certainly a help toward a cure of visceral prolapse. The application should be made daily, or twice daily, and continued from eight to ten minutes.

(To be concluded.)

A NEW OPERATION FOR RETROVERSION.

BY J. H. KELLOGG, M. D.

ANTERIOR vaginal fixation, as first suggested by Dülerssen, consists in opening the peritoneal cavity between the uterus and the bladder, by incising the vaginal canal just anteriorly to the cervix, and separating, by careful dissection, the uterus and the bladder. A suture is then inserted into the body of the uterus near the top of the fundus, and the fundus drawn forward, and attached to the edges of the vaginal wound.

This operation may be considered as a very satisfactory one. However, it was the impression of the writer that it might be improved if it could be performed without invading the peritoneal cavity. A year or two ago, in performing the operation of vaginal hysterectomy, the writer succeeded in enucleating the entire uterus from its connective tissue capsule without opening the abdominal cavity, and without the application of a ligature or clamp. Only two or three snap forceps were applied. This had been previously done by others. The comparative ease with which the operation was performed suggested the possibility of performing anterior fixation of the uterus without penetrating the peritoneal cavity.

On Feb. 5, 1896, I undertook this operation for relief of a case of retroversion, and found the operation not more difficult than I had anticipated. A curved incision was made, extending over about two fifths of the circumference of the cervix, at its junction with the vagina. By combining the use of the scissors, the handle of the knife, and the finger, I was able to separate the capsule to the top of the fundus. A silkworm-gut suture was passed deeply into the tissues at this point, the two ends of the suture being passed through the edges of the vaginal wound. In tying the suture the uterus was anteflexed. The suture was left in place for four weeks. By this method the surfaces are brought together in the tightening of the suture in such a manner as to secure immediate and perfect union; the anterior

wall of the uterus is shortened, and the uterus tilted forward.

This operation, in the opinion of the writer, possesses advantages over every other which has been proposed for the relief of retroversion, with the exception of that of shortening the round ligaments. The latter operation, which the writer has performed more than four hundred and fifty times, with no mortality, and less than five per cent. of failures, unquestionably affords the most physiological and practical method of dealing with retroversion in the great majority of cases. Cases of retroflexion, and those in which the uterus is so lacking in tone and so flexible that it has a tendency to tip backward, even though the ligaments have been well shortened, are also suitable subjects for this operation, which may be combined with the operation of shortening the ligaments. The failures which the writer has encountered are mainly of this class. By a combination of extra-peritoneal anterior vaginal fixation with the operation of shortening the ligaments, the uterus may be most securely fixed in position, no matter of how long standing the retroversion may be, nor how extreme the degree of displacement.

The operation requires some experience and skill, a thorough knowledge of the anatomy of the parts, a delicate touch, and great care to avoid penetrating the bladder or the peritoneal cavity ; but neither of these accidents is likely to occur if the operator is sufficiently experienced. Care must also be taken to avoid wounding the ureters, and also to avoid injury to large blood-vessels. The dissection is made largely with the finger and the handle of the knife. The most difficult part of the operation is the insertion of the suture, which must be accomplished largely by the sense of touch. The suture is looped through the eye of the long Hagedorn needle, the needle inserted into the tissues as near the top of the fundus as possible, and the loop caught by a hook, the needle drawn back, and one end of the suture drawn through. One end of the suture is then passed through the tissues on the upper side of the vaginal wound ; and the other is inserted deeply into the tissues of the cervix, so that when the suture is tightened at the closing of the operation, the fundus is drawn toward the cervix, until slightly anteflexed. No inflammatory reaction occurs, and there is little or no suffering from the operation.

The tissues which fall together are raw surfaces, and unite by immediate union, so that the uterus is very solidly fixed in its forward position. The field of the operation extends so little beyond the median line, on either side, that no large blood-vessels are involved. In the cases in which I have operated, I have not found it necessary to apply a single ligature, three sutures having proved sufficient to close the wound. The peritoneal cavity is not invaded, and, so far as the writer knows, this is the simplest method that has yet been devised for anterior fixation of the uterus. Dr. Vineberg, of New York, has reported a large number of cases in which he has satisfactorily employed anterior vaginal fixation, and from his description of the surgical methods of treatment of retro-displacements of the uterus, before the New York Academy of Medicine, the writer has the impression that Dr. Vineberg, has sometimes completed the operation of anterior vaginal fixation without entering the peritoneal cavity, though the method which he described involved the suturing of the broad ligaments, which would seem to necessitate the opening of the peritoneal cavity. This operation is one which should be reserved for cases in which pregnancy is not likely to occur, as recent observations have shown that anterior vaginal fixation interferes with gestation.

The Transmission of Tuberculosis. — From experiments recently made by Jäckh (*Virch. Arch.*, 1895), it seems to be proved that tuberculosis may be transmitted from the male through the agency of the seminal fluid. The semen from tuberculous patients who had died from either chronic or acute pulmonary tuberculosis, when introduced into the abdomen of guinea-pigs and rabbits, gave positive results in nearly every case.

Toxin and Antitoxin in the Blood. — A toxin exactly like that found in the venom, but associated with an antitoxin, is found in the blood of a viper. Exposed to a heat of 588° C., this toxin disappears in fifteen minutes, leaving the antitoxin, which renders immune against viper's poison animals into which it is injected.

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

EFFECTS OF MASSAGE UPON THE CIRCULATION.

DR. GEORGE OLIVER, in a recent lecture delivered before the Royal College of Physicians at London, gave an excellent summary of the effects of massage upon the circulation of the blood, which we quote from the *British Medical Journal* for June 13, 1896, as follows: —

"The circulation of blood through the manipulated tissues is accelerated and increased. This fact has been clearly demonstrated experimentally on dogs and cats by Lauder Brunton, and Tunnicliffe: —

"'1. During the massage of muscles the flow of blood through them is increased.

"'2. Immediately after the cessation of massage an accumulation of blood occurs in the massaged muscles; this is rapidly followed by an increased flow through the muscles.

"'3. The massage of a considerable muscular area causes first a slight rise in the general blood pressure; this is followed by a fall which in some cases amounts to one fifth of the initial blood pressure.'

"The results of my observations in man coincide with these conclusions. The local effects on the radial pulse are easily learned by applying the various forms of massage to the muscles of the forearm. The lighter and superficial manipulations, such as stroking, *effleurage;* and vibratory movements or percussion such as hacking, punctuation, slapping, etc., raise the radial blood pressure and caliber; while the intermittent rolling and squeezing of the muscular tissue (*pétrissage*) reduce them.

"The immediate effect of all the forms of massage is to raise the blood pressure and to enlarge the caliber of the artery. This preliminary stage is maintained for some time while the more superficial and vibratory manipulations are being employed; but it is very transitory indeed when that form of massage is applied which freely moves the muscular tissue, and is quickly followed by a very decided and sharp reduction of the radial caliber.

"From this it would seem probable that the first effect of massage in its various forms — and an effect which is, moreover, maintained throughout the application of the superficial and vibratory manipulations when limited in duration — is to induce vasomotor contraction in the terminal vessels, and thus to raise the blood pressure and the caliber in the intermediate arterial tubing between them and the heart. This may, therefore, be regarded as the vasomotor tonic aspect of massage when that process assumes the forms of stroking, vibration, and percussion, which therefore raise arterial tension. When, however, the muscular tissue is freely manipulated and rolled, the vessels therein dilate, and the flow of blood through them is increased and accelerated by the rapid manipulations acting in the manner of a supplementary heart, and the blood pressure and caliber of the radial and other systematic arteries fall. This is the vasomotor relaxant effect of massage which reduces arterial tension. When the muscles of all the limbs are manipulated, the radial caliber and pressure fall. There may be perceived a large ictus after the manipulations, but it is unsafe to infer therefrom that the radial caliber is increased; for arteriometric measurement has shown that when the pulse tension is reduced, the pulse-stroke generally feels larger, though the caliber of the vessel is actually diminished.

"The diversion of the blood to the capacious periphery located in the muscles is no doubt a leading cause. But there is some evidence that points to the conclusion that this may not be the sole cause.

"When vigorous massage is applied to the back and the limbs for twenty or thirty minutes, the normal postural variations of the radial caliber and pressure are apt to become — if they do not invariably become — reversed, so that they measure less in the sitting than in the recumbent posture; and when this happens, it has been found that manipulation of the abdomen for eight or ten minutes restores the normal formula of the pulse.

"It would, therefore, seem probable that massage, when confined to the systematic muscles, disposes to the accumulation of blood within the capacious venous system of the abdomen. Glovetzky made

a large number of experiments on men and dogs to show the effects of abdominal massage on the circulation. He found that the upper half of the body increased in weight after the séance, as shown by Mosso's balance, and plethysmographic measurements proved that during the sitting, both the upper and lower extremities increased in volume, but returned to their normal size after the massage. The blood tension and the intracranial pressure invariably rose during the massage, and the elevation lasted for a certain period afterwards.

"But though a short application of abdominal massage may restore the normal contraction of the vessels supplied by the splanchnic nerves, its continuance beyond a very limited period is apt to defeat the aim in view; for then it is not improbable either that the contractility of the vessels becomes exhausted, and dilatation of them is thus favored, or the heart's action is lowered through reflex overstimulation. So that it would seem to be best, as a rule, to apply massage to the abdomen in some of its vibratory forms, and for a brief period only, and after the general massage has been performed.

"*Massage and Exercise.*— It has been pointed out that in exercise — local and general — the volume of the limb is considerably increased from the afflux, and probably also from the infiltration of watery fluid from the gorged vessels into the substance of the muscles. Volumetric observation of the arm has shown that massage, when applied for a short time — for example, from seven to ten minutes — generally induces a slight diminution of the limb. Therefore, it would seem probable that any watery exudation that may flow from the blood is pressed forward from the lymph spaces into the lymphatics.

"The practical outcome of these observations, which probably coincides in the main with the teachings of general experience in regard to massage, seems to be the following: —

"Massage should not be prescribed and performed in a mere perfunctory routine fashion, as is to be feared it too often is, but, like other therapeutic measures, it should be applied with due discrimination. The leading features of the circulation are the best indications for the selection of the kind of manipulations to be adopted, for the limitation of the time of their application, and for the distribution of them, whether mainly to the viscera or to the systemic muscles. When, for example, the vasotonic effects are sought for, the manipulations should partake chiefly of the nature of vibration or percussion; and in those cases in which muscle kneading is resorted to, percussion should terminate the process. When, on the other hand, the aim is to reduce arterial tension and to relieve the ventricular effort, the deep movements should be preferred throughout, and should be applied only to the limbs and back, the abdomen not to be manipulated.

"RESISTIVE MOVEMENTS.

"Certain exercises in which the operator offers resistance are of special value in the development of the muscles, and in the acquirement of muscular tone and vigor. This system of exercise to which I refer is known as the Swedish system. Nearly fifty years ago, Saetherberg, of Stockholm, applied this method to the treatment of heart disease, and reported his results some fifteen years later; and following him, one or two other observers have shown the value of resistive gymnastics in cardiac disease. But the method has only of late years acquired prominence as a definite therapeutic mode of treating failing compensation of the heart since the brothers August and Theodor Schott modified it in certain respects, and applied it under proper restrictions, either in conjunction with or apart from the baths administered at Bad Nauheim.

"The few observations to be adduced refer only to the physiology of these exercises, or rather as to how the results which are believed by some to be obtained from them are brought about. Two somewhat conflicting theories are entertained. On the one hand, Dr. Theodor Schott ascribes it to reflex stimulation of the cardiac inhibitory nerves, causing the heart to beat more forcibly and more slowly; on the other hand, Dr. Bezly Thorne, Sir William, and Dr. John Broadbent, refer it to dilatation of the arteries supplied to the muscles. I have merely to submit a few observations on several healthy subjects, ranging in age from thirty-two to forty-six, which may be regarded as having a bearing on one of these views.

"In one case, that of a healthy doctor aged thirty-seven, the five arm movements were distributed over thirty minutes, the intervals of rest being equal to the duration of the exercises. At the termination of the first exercise, the caliber was found to be two points and the pressure ten points higher, but after each of the four subsequent exercises the caliber and the pressure were found to fall rapidly; and at the close of the observation, the former was found to be nearly 1 millimeter and the latter thirty points lower than the initial records. The frequency of the pulse fell from 88 to 82 (sitting).

"In another case of a healthy man, aged forty-six, subjected for thirty minutes to the arm exercises, followed by forty minutes' rest, succeeded by the three trunk movements, there was also an initial rise of radial caliber and pressure, followed by a rapid fall; and after the long interval of rest this reduction was further intensified by the trunk movements. The pulse rate fell from 84 to 74 (sitting).

"In a subject aged twenty-six, the volume of the arm was measured before and after four arm exercises of two minutes each, interrupted by one minute of rest. The initial volume of 1648 c. cm. was increased to 1696 c. cm., and the increment was entirely removed by the application of massage for fifteen minutes, and was replaced by the resistive movements for ten minutes.

"It has been observed that the increased volume caused by the resistive exercises may persist for several hours. These observations in healthy subjects have shown that the slow resistive exercises produce the following effects on the limb and on the radial pulse: —

"1. An increase in the volume of the limb.

"2. At first a rise and then a decided fall in radial blood pressure and caliber.

"3. A reduction of the frequency of the pulse.

"The reduction of the radial pressure and caliber is no doubt due to the diversion of a large volume of blood to the capacious muscular periphery. The immediate increase of the volume of the limb is direct proof of this fact; but as in ordinary exercise, the persistence of the enlargement for many hours shows that it is not due entirely to the temporary filling of the vessels within the muscles, but probably arises from an infiltration of fluid derived from the blood into the muscular tissue. This system of regulative movements, therefore, produces all the local physiological effects of exercise; but it prominently differs from ordinary exercise in one respect; namely, in the slowing of the heart's action. In general exercise the condition of the radial artery does not truly indicate the degree of tension that exists within the central arterial system from the augmented propulsion of blood into it; for the blood pressure at the point of observation is reduced by the dilatation of the branches which at higher points convey the increased flow of blood to the muscles.

"In the early stage of exercise the radial tension is increased; but this is transitory, and is replaced by a reduction when the muscles begin to monopolize the blood supply. Exactly the same thing occurs as a result of the resistive exercises. As a matter of fact, it is known that in general exercise there is an increase of the mean blood pressure, notwithstanding the enormous diversion of blood to the muscles. But if the resistive movement method is but a form of exercise, why should it slow the heart while exercise accelerates it? It may be presumed that there is in both a rise in the mean blood pressure. According to Marey's law, there should be in both a slowing of the heart's action. In exercise it is obvious that the operation of this law is disturbed by other concomitant conditions, which determine an acceleration of the vascular pump, and by the increase of the respiratory movements. Now, when the resistive exercises are practised, the greatest care is taken not to allow the movements to accelerate the patient's breathing, and he is directed to breathe calmly and regularly; so there is eliminated from this mode of exercise the main, if not the sole, cause of the acceleration of the heart which is invariably present in ordinary exercise; and the slowing of the vascular pump is just as likely, perhaps more likely, to be due to a slight rise in the aortic pressure as to reflex cardiac inhibition (the theory of Dr. Schott). The former view, which was pointed out by Dr. Saundby, is more in accord with our knowledge of the physiology of exercise than the latter; and, moreover, it affords a reason why the exercises are regarded by Dr. Theodor Schott and others as un-

suited to cases of myocarditis, of aortic aneurism, and of advanced arterio-sclerosis.

"The examination of the radial pulse by means of the finger and of the sphygmograph affords but equivocal evidence bearing on this point; and from what we know of the anatomical relations of the radial artery to the muscles, and of the physiological influence of the circulation through the muscles on the radial tension, it becomes, I think, somewhat doubtful if the radial pulse can afford trustworthy evidence of any alteration in the blood pressure which may be induced in the large arteries by the exercises.

"It should be observed that the retardation of the heart's action, as well as the copious delivery of blood into the muscular periphery, must greatly limit and reduce any rise of arterial blood pressure that may take place. Hence these modulated movements throw less strain on the central arteries than ordinary exercise. The slowing of the heart is, therefore, a favorable sign; for it is an indication that the rise of blood pressure is being reduced by inhibition, and that the ventricle is not being subjected to an injurious strain by the exercises, and is duly responding to them in a more complete delivery of the blood.

"Doubtless the immediate relief to the loaded heart afforded by this therapeutic method should be ascribed to the aspiration of a large volume of blood into the capacious muscular periphery by means of the tonic contraction of all the systemic muscles, so gentle and so maintained as just to fall short of stimulating the respiratory center. The blood thus determined to the periphery must gradually return to the heart; and if the relief obtained is entirely due to this diversion of the blood, it will be of comparatively short duration. But there is some reason to believe that the volume of the blood is reduced during its sojourn through the muscles, and if the fluid withdrawn from the blood, lodges for some time in the muscular tissue, the intervals of relief should be prolonged.

"The total outcome, therefore, of the exercises is a transference of blood from the venous to the arterial side of the circulation, and a probable reduction of the volume of the blood.

"I think it is not improbable that under physiological conditions the ventricular output is not, as a rule, ample enough to maintain the normal volume of the blood in the arteries while they are being largely depleted by the increased drain into the muscles in a state of vigorous contraction; whereas, when the ventricle is dilated, which involves dilatation of the other chambers of the heart, and can be incited to throw off the augmented load of residual blood, the arterial tension may rise in spite of the increased flow into the muscles.

"This strictly physiological mode of developing and invigorating the walls of the heart, when applied with proper care and discrimination, is a therapeutic method of some value, and is a distinct addition to our resources for the treatment of failing compensation of the heart. I have observed several times that it has restored compensation after the complete failure of drugs, and that it is in suitable cases a useful auxiliary to other treatment. Like any other remedial method of decided power, it may do harm when inappropriately or improperly applied. In all cases I have found that the greatest caution should be exercised — especially in the early application of the method — to reduce the rate of the exercises to a minimum. There is often a disposition on the part of the operator to quicken the speed; this should always be deprecated unless such acceleration is fully warranted by the improvement attained.

"There is no reason why the principle which underlies this physiological method of treatment; namely, tonic contraction of successive groups of muscles, should not be attained in other ways and especially by mechanical means. Much may be done by the patient himself without an operator; and it has been found that autoresistive exercises are useful in maintaining the advantage gained in the first instance, by the ordinary application of the method."

CYCLIC ALBUMINURIA.

In an excellent lecture upon this subject, delivered at the Hotel Dieu, Paris, by Dr. Pierre Marie, and reported in a recent number of the *Medical Week*, this eminent physician gives a very graphic description of this little-known disorder which is an occasional cause of great perplexity to physicians.

Cyclic albuminuria is characterized by the appearance of albumin in the urine of an apparently healthy subject, in an intermittent manner, and subject to certain influences. In some cases the albumin appears only when the patient is standing or active during the daytime, and disappears wholly during sleep. Muscular exercise and an upright position seem to be the principal causes which influence the appearance of albumin in the urine in these cases.

Albumin is sometimes produced alsc by the itch parasite and other causes of skin irritation. This ephemeral albuminuria, however, occurring in connection with skin diseases, and sometimes in persons who are in perfect health, is not true cyclic albuminuria. The taking of food, as is well known, sometimes gives rise to the appearance of albumin in the urine. Cold, and particularly cold baths, produce the same effect. A storm, mental worry or anxiety, and the influences which affect the nervous system may give rise to albumin in the urine, even when the patient remains in a horizontal position.

The amount of albumin which appears in these cases is always small, rarely exceeding one tenth of one per cent.; generally less. The specific gravity of the urine is usually normal or above normal. The acidity is somewhat increased. There is an increase of coloring matter, and an increase in the amount of urates and of urea. The cycle usually lasts from twelve to thirty-six hours.

This disease is most frequent in males. Of fifty-three cases, forty-nine were men. The disease is frequently observed under the age of fifteen years, and rarely noticed after thirty years. The causes are obscure. The disease sometimes appears to be a family characteristic. According to Teissier, it occurs most frequently in the children of gouty and arthritic parents,— another illustration of the proverb, "The fathers have eaten sour grapes, and the children's teeth are set on edge."

Pavy regards cyclic albuminuria as a dietetic disease analogous to the phosphatic diathesis. Merely and Teissier regard the disease as the result of imperfect oxidation of the albuminoids or a disease of "retarded nutrition" (Bouchard).

Teissier has recently suggested that this disease may be due to the functional activity of the liver. Exudates are frequently found in great excess in the urine. Moxon believes the disease to be due to an irritation of the parenchyma of the kidney by the passage of oxalates. Bull, Talamon, and others also attribute the disease to an irritation of the kidney indicative of an organic lesion of the organ,— a sort of latent nephritis which may develop, in later years, as shown by Lecorché and Talamon, in a small, contracted kidney.

To the influence of the great sympathetic must be attributed the appearance of albumin in the urine, as well as many other symptoms which are due to vasomotor disturbance. It is very likely that the upright position acts upon the kidney through the influence of this posture upon the sympathetic, and less upon the kidney. In the upright position the sympathetic must be more or less stimulated by the tension of the viscera upon the branches of the great sympathetic distributed to them.

Effects of Baths upon the Circulation.— Dr. George Oliver, in a Croonian lecture recently published in the *British Medical Journal*, thus summarizes the influence of baths upon the circulation: —

"It may be said that the leading effects of baths on the circulation are due to temperature; and as the results of observation with the arteriometer coincide with the generally accepted views on the influence of baths and temperature on the vasomotor system, I will merely state the conclusions which they support.

"*The Hot Bath.*— It has been observed that hot immersion baths (from 100° to 105° F.) quickly reduce the radial caliber and pressure from the rapid dilatation which takes place in the arterioles and the cutaneous periphery. From this cause the volume of a limb taken immediately after the immersion is found to be considerably increased, but the increment rapidly subsides. In one example, the initial volume of 1640 c. cm., was raised by the hot bath to 1744 c. cm., which fell in five minutes to 1680 c. cm., and in ten minutes to 1664 c. cm. The enlargement is obviously due to a temporary turgescence of vessels, and therefore differs from that caused by exercise.

"Warm immersion baths (from 96° to

100° F.) enlarge the radial caliber, though after a certain time the peripheral vessels become relaxed and filled, and the radial is consequently reduced.

"Turkish baths, like hot immersion baths, quickly congest the cutaneous peripheral vessels and the veins, and consequently reduce the arterial pressure. When followed by the cold shower, the arterial pressure immediately rises and the radial caliber consequently increases, but may not quite attain its former size. It will be shown in another lecture that the volume of the blood is frequently much reduced.

"*The Hot Foot Bath.*—The well-known revulsive action of the hot foot bath in reducing the arterial fulness in the upper part of the body has been illustrated by the arteriometer, for it has shown that an immersion of twenty minutes may reduce the radial diameter from 2.2 mm. to 1.3 mm. The same fact was demonstrated by Winternitz as the result of the warm sitz bath, for he found that the plethysmograph indicated a reduction of the size of the arm; and Schüller observed that the vessels of the exposed pia mater of the rabbit were diminished in size in proportion to the extent of the body immersed in warm water.

"*The Cold Bath.*—It has been observed that immersion in plain water of temperature below 90° F. produces contraction of the systemic arteries within three minutes, the amount of contraction being proportionate to the reduction of the temperature. It would seem from the experiments of Schüller that the blood thus diverted from the outer vascular area congests the vessels within; for on immersing rabbits into cold baths he observed dilatation of the vessels of the pia mater (exposed by trephining) in proportion to the extent of immersion. This diversion of the blood from the surface is, however, but temporary, and is followed by increased fulness of the systemic vessels after the immersion is over, or even while it continues if the subject is very vigorous. The local application of cold water—as in the cold sitz bath—is also of considerable therapeutic power when the principal aim is to divert an increased quantity of blood to the brain and the cord, as when the vasomotor mechanism is impaired and gravitation determines anemia of the nerve centers. According to the observations of Winternitz, the cold sitz bath increases the volume of the arm as registered by the plethysmograph; so that it possesses the power of increasing the distribution of blood in the upper parts of the body. We have here a reasonable explanation of the clarifying effect of the cold sitz bath on the mental haziness and dulness consequent on cerebral anemia from impaired vasomotor compensation.

"*Shower, Needle, and Douche Baths.*—The influence of temperature *per se* is greatly modified by the mechanical agency of percussion and vibration, so that when the water is divided into innumerable fine jets which impinge all over the surface of the body with a certain degree of force, or when it is applied in the form of the traveling douche accompanied by a vibratory form of massage, the vasomotor system is much more powerfully affected than by any form of still bathing, even though the water be charged with carbonic acid or saline matter. The therapeutic advantages of this form of bathing are very considerable, for it can be made to furnish all the tonic effects of cold bathing along with an agreeable temperature that may be adapted to individual requirements. A more intelligent appreciation of the curative value of this and of similar forms of tonic bathing now prevails at many health resorts, where in times gone by a course of bathing often simply meant soaking in hot water with the consequent impairment of the vasomotor mechanism. The massage, douche, and needle bath is the form of bathing best of all adapted to counteract the enervating effects of city life, with all its attendant worries and anxieties; and were it established in our large centers, it would, I am persuaded, prove to be a boon to many sufferers from nervous exhaustion, and would become even more popular and valuable than the Turkish bath.

"Carbonic acid and saline baths also belong to the stimulant form of bathing."

Picric Acid for Burns.—French surgeons have recently been using a solution of picric acid for the first treatment of burns. It has been found that the pain which is caused by the burning of the skin can be almost immediately alleviated, or altogether removed, by painting the surface with a strong solution of picric acid.—*Medical Times.*

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

Relation of Streptococci to the Diphtheria Bacillus.— Bonhoff (*Hygienische Rundschau*, 1896) has shown that mixed cultures of streptococci and Loeffler's bacillus are much more virulent than either the diphtheria bacillus, or the streptococci alone. It was particularly observed that nephritis occurred when toxins of pure cultures of streptococci were added to the diphtheritic cultures employed.

The Origin of the Pigment Malaria.— Sakharoff has recently shown, by experiments upon the blood of fowls, that the formation of granulations and vacuoles in the red corpuscles is due to decomposition of hemoglobin and hematin and of the albuminoid elements. By experiments upon guinea-pigs the author has established the fact that the granules of eosinophyles are identical with those observed in the nuclei of hematoblasts.

Typhoid Bacilli in Urine.— Semple (*Lancet*) has examined the urine of seven typhoid fever patients for the purpose of demonstrating the presence or absence of typhoid bacilli. He made cultures of the urine, and in six cases easily demonstrated the presence of typhoid bacilli.

Serum Cure of Plague.— Dr. Kitasato, of Japan, announces the discovery of a serum which is capable of curing the plague in a few hours. He also claims that the same serum will cure diphtheria, cholera, and leprosy.

Formalin.— Numerous carefully conducted experiments have demonstrated the great value of formalin as a disinfectant. Formalin has a very peculiar odor, but this quickly disappears from articles disinfected. It may be used in gaseous form, or in solution. A solution of formalin effectually prevents the growth of the most dangerous pathogenic microbes, such as the bacilli of anthrax, of typhoid fever, diphtheria, cholera, and such pus-forming germs as the staphylococcus pyogenes aureus.

In a one-per-cent. solution, formalin will kill nearly all pathogenic microbes in thirty minutes. A three-per-cent. solution kills all pathogenic microbes except those of anthrax in one minute. The bacillus of anthrax requires three minutes. A three-per-cent. solution of formalin containing a small per cent. of alcohol renders the hands completely sterile. Clothing, furniture, etc., may be completely disinfected in ten minutes, without injury, by spraying with a ten-per-cent. solution of formalin. Fecal matters may be almost immediately deodorized by a one-per-cent. solution. A weak solution of formalin is an excellent preservative of tissues. It is useful therapeutically as an application to the bowels, by which a sloughing is produced, causing a speedy separating of the dead from the living tissues.

Identity of the Diphtheria Parasite in Man and Animals.— M. Danilewski (*La Presse Medicale*, 1896) has recently called attention to a large number of observations made by him which point to the correctness of a theory which he announced a number of years ago, that the malarial parasites of man and lower animals are identical. He believes that Dimattei was led to dissent from this view by the fact that the pigeons which he studied were suffering from chronic malarial affection, in which form the disease is little susceptible to quinine, fever also being absent. Gratia has recently shown that the serum of Behring and Roux has no effect whatever upon the diphtheria of birds, from which he argues that the disease must be wholly distinct from the allied disease in human beings.

Elimination of Micro-organisms by the Kidneys.— A. Beidl and R. Kraus have, by carefully conducted experiments, recently shown that microbes introduced into the organism by injection into the veins appear in the urine within from five to twenty minutes, the urine appearing clear and free from albumin. The elimination is not uniform in character, however, the proportion varying from moment to moment; and as regards the kidneys, the elimination of bacteria through them seems to be increased by diuretic sub-

stances and by the injection of glucose. These experiments show that the elimination of bacteria may take place by the kidneys without rupture of the vessels of these organs. These investigators believe that the elimination is effected by a process of diapedesis.

The Production of Biliary Calculi by Microbes.— Experiments conducted by MM. Gilbert and Fournier, and recently reported to the Society of Biology (*La Presse Medicale*, February, 1896) show that various organisms are active in the production of biliary calculi; as the typhoid bacillus and other organisms which infest the alimentary canal, but that the colon bacillus plays by far the largest rôle in the production of biliary calculi, both in human beings and lower animals.

The Influence of Electricity upon the Toxins of Bacteria.— MM. d'Arsonval and Charrin have lately shown that the electrical current of high frequency may be applied to an inoculated animal in such a way as to render harmless the toxins of the bacillus pyocyanous and Loeffler's bacillus, but so to attenuate these toxins as to render them useful as vaccines. This observation is an exceedingly interesting one, and we hope the investigators will continue their experiments, and develop some practical method whereby currents of high frequency may be used therapeutically in the treatment of diphtheria. The well-known fact that these currents can be applied to the body without the production of sensation or any unpleasant effects, taken in connection with these experiments, gives ground for hope that in alternating electrical currents of great frequency we may have a valuable remedy in the treatment not only of diphtheria but of other infectious maladies.

The Bacteriology of Malignant Tumors.— Peterson, of Heidelberg, reports (*Medical Week*) that in a clinic of Professor Czerny experiments have been made with both sterilized and filtered cultures of the streptococcus pyogenes and the micrococcus prodigiosus, and with the serum of animals inoculated with the cultures of both these germs. The result of these experiments has been, on the whole, unsatisfactory. In one case, a cancer which had been comparatively inactive, developed into general carcinomatosis a short time after the injection. In one case a sarcoma diminished in size sufficiently to permit its extirpation. Dr. Senger, of Crefeld, reported at the General Congress of Surgery, held in May, 1896, a case of the cure of sarcoma by an attack of erysipelas.

Bacteria of the Vagina.— Dr. Chas. Jewett has been studying the bacteria of the vagina in the newly born, and summarizes his conclusions as follows: —

1. The vagina remains sterile for at least two hours after birth. From this time until the third day micro-organisms may or may not be detected; the number of cases where bacteria are found, gradually increases as time goes on, and the bacteria-free secretions diminish. After the third day micro-organisms are always present in the secretion of the vagina.

2. Pathogenic organisms are relatively frequent; staphylococcus pyogenes albus and aureus are observed in four per cent. of the cases; streptococci, in 14.6 per cent. of the cases.

Antitoxic Serum in Smallpox.— M. and A. Bécleré recently communicated to the Academy of Medicine, Paris, the result of observations made by them, which indicate the probability that they have discovered a means of treating smallpox by an antitoxic serum with the same degree of success that has attended the treatment of diphtheria. The serum is obtained from the blood of vaccinated animals, and is used in the same manner as the antitoxic serum which is employed in the treatment of diphtheria.

Typhoid Germs in Ice.— The military officers at Rennes (*Medical Press and Circular*) have recently suffered from a typhoid epidemic, which has been traced to the ice which was used to cool the champagne at a banquet. The ice had been taken from a neighboring river at a point where the town sewers empty.

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THE FUNCTIONS OF THE STOMACH.

THE great progress which has been made in the study of the chemical processes of digestion has not been attended by a corresponding progress in the therapeutics of indigestion, probably for three reasons: —

1. Because too much reliance has been placed upon pharmaceutical preparations as a means of correcting the morbid conditions of the stomach.

2. Because of insufficient attention paid to other functions of the stomach than those concerned with the chemical processes involved in the liquefaction of the food.

3. Because of neglect to consider the fact that proper liquefaction of food in the stomach requires the conversion of the starch by salivary digestion as well as the solution of proteid matters by the gastric juice.

Indeed, from numerous observations made by the writer, the conclusion seems just that the failure of proteid digestion in the stomach is much less likely to give rise to disordered digestion than the imperfect digestion of starch. It is probably for this reason that an exclusive meat diet, the milk diet, and other dietaries excluding starch have won so much reputation in the treatment of chronic indigestion. These exclusively nitrogenous dietaries are most successful in cases of hyperpepsia, although these are the very cases in which, from a physiological standpoint, they would seem to be least indicated.

It is in hyperpepsia also that the inconveniences arising from the indigestion of starch are most likely to occur. The fermentation of starch is an acid fermentation. This may occur in connection with hyperpepsia, while the fermentation of proteids is hindered by the presence of an abundant quantity of hydrochloric acid in the stomach. Hence we find proteid fermentation most frequent in hypopepsia, and acid fermentation most frequent in hyperpepsia.

Professor Moritz, of Munich, in a recent lecture made a number of interesting points, some of which are almost revolutionary in their significance. They may be summarized as follows: —

1. The digestion of animals — at least, dogs — may be maintained after the removal of the stomach, as is shown by the experiments of Czerny and Kaiser. This agrees with the observations of Noorden, Ewald, and others, upon human beings, to the effect that good health may be maintained notwithstanding the existence of almost complete apepsia, the liquefaction of food in these cases depending upon the action of the saliva in converting the starch into dextrin and sugar. This change is often found to be complete in cases of apepsia, according to the writer's observations.

2. Von Mering, Moritz, and Brandl have shown by experiments that the stomach cannot be regarded as an organ for absorption, except for alcohol. Since alcohol is an artificial and not a natural product, and never intended by nature to serve as a food, it would appear from these experiments that the stomach cannot be regarded as an organ of absorption, except with relation to morbid and toxic substances.

3. The result of this fact is that the food-substances of the stomach are kept in a diluted condition, and thus prepared for easy entrance into the intestines, and

for ready absorption after their passage from the stomach into the lower portion of the digestive tract. Röhmann has observed that concentrated solutions of sugar are not readily absorbed in the intestine, and that solutions having a strength of .5 per cent. are most readily absorbed.

4. Quincke has shown that equalization of temperature takes place readily in the stomach, and that the stomach is not much disturbed by considerable extremes in temperature, although this is not true of the intestine. Bunge has shown the importance of the antiseptic function of the stomach through the influence of hydrochloric acid. We showed in a paper recently read before the American Academy of Medicine that the stomach itself is an organ of antisepsis, independent of the hydrochloric acid which it contains. Professor Moritz goes a little further, and claims for the stomach that its chief purposes are: (1) To serve as a reservoir in which the food is liquefied and its supply to the intestine regulated, thus favoring complete digestion and absorption; (2) Protection of the stomach against bacterial, chemical, and thermal causes of injury by disinfection, by dilution, and by the modification of temperature.

The paper read by Professor Moritz was published in the *Münchener Med. Wochen.*, No. 49, 1895.

MOVING TOWARD THE LIGHT.

THE modern developments in physiological chemistry and bacteriology, as well as the accumulated evidence of experience, has convinced the great majority of skilled and well-educated physicians in the ranks of homeopaths, that the sectarian bounds of their school were too small for the exercise of the practise of rational medicine; and numerous attempts have been made to enlarge the boundaries set by Hahnemann, the founder of this school of medicine.

This movement has finally gained such proportions that there was recently organized at Buffalo a medical society known as the American Association of Physicians and Surgeons, made up of qualified members of the profession of different schools, the purpose of which is to break down the bars of sectarian medicine, and make a platform large enough to admit any intelligent or qualified practitioner, irrespective of his sectarian antecedents. So far as its medical creed is concerned, the regular profession has long ago abandoned sectarianism, and ceased to subscribe to the principle of *contraria contraris curantur* attributed to it by Hahnemann.

We are glad to see this movement. It is in the right direction, and it is the sincere hope of the writer that sometime in the future there may be only two recognized classes of physicians; viz., those who are practising medicine on a rational and physiological basis, and those who are pursuing blindly irrational methods.

The long fight among the different schools of medicine has been based upon differences of opinion upon the so-called action of drugs; but intelligent physicians are finding out (many long ago made the discovery) that in the relation of the human body and drugs, it is the cells of the body which are active, and not the drugs. The body acts upon the medicine, not the medicine upon the body. Modern developments in hydrotherapy, electrotherapy, massotherapy, and the various branches of physiological medicine, including dietetics, have left comparatively little room for pharmaceutical products, so it is exceedingly foolish to still maintain the old quarrel about big doses and little doses, when doses of any sort have so small a part to play in the rational treatment of disease. The high-potency delusion seems about dead.

THE TRAMP MALADY.

The disposition to wander incontinently from place to place seems to be a sort of disease. Certain persons seem to be afflicted with the tramp temperament, or cachexia; they cannot remain long in one place,— or, at least, do not,— but are continually moving on, perhaps partially from compulsion, as there seems to be, everywhere, a disposition to invite the tramp to pass on to some other locality.

As a rule, tramps are men of little education or men who have made a failure in life, and who, if they have trades, have acquired so little efficiency in their chosen occupations that their labor is desirable only when there is a scarcity of unemployed persons of that trade. Tramps are sometimes persons who have once had homes and families, but, through death or other circumstances, have been separated from them, and are, so to speak, turned loose in the world without anchorage anywhere, and without any one whom they can call a friend, or a place which they can properly call home.

There seems to be an increasingly large number of persons who, from one cause or another, have acquired the tramp habit, and are continually moving from one place to another, obtaining a precarious living through exposure and the uncertain supply of food, raiment, and lodging.

That the tramp evil has existed for hundreds of years is evidenced by the mention of "vacabundes" and "beggars" in the history of the reign of Henry VIII of England, to whom they gave much trouble.

All sorts of methods have been adopted to suppress the tramp evil, such as whipping, branding with hot irons, putting in the pillory, placing in chains, in fetters, in prisons, lopping off the ears, etc.; but all to no purpose. The Russian government has recently adopted, in Moscow and St. Petersburg, the plan of keeping able-bodied tramps and beggars in a large workhouse, and supplying them with employment for which they are paid ten cents a day, sending all who are sick to the hospital, where they receive proper treatment. This method seems much more sensible than that which is adopted in the United States, which consists simply in arresting the tramp and shutting him up in jail, this being in a great majority of cases exactly what he wants, as it insures him comfortable quarters during the cold weather, and plenty to eat and drink.

The writer would be glad to see organized in every large city and in other localities where tramps abound, a tramps' lodging-house, which might be called "The Working Man's Home," to give it an air of respectability. Such a place should furnish clean beds and a low rate for lodging — say ten cents a night — and should have connected with it free baths, free laundry, a penny lunch-counter, a reading-room, a lecture-room, respectable toilet-rooms, all being conducted in a kindly spirit, so as to make the wanderers feel at home.

Another important accessory would be an industrial department, in which every man would be required to work enough to pay for his lodging when not able to pay for it in money. There are various occupations in which skilled labor can be employed, such, for example, as weaving mats and rag carpets with a hand-loom, bottoming chairs, dressing over furniture, making kindling, etc. From what the writer has seen of the results of such work in Chicago and other large cities, he believes that much might be done to lessen the number of tramps by showing a friendly interest in these poor, depressed souls, and encouraging them to rise to a higher plane of life.

Neurasthenia not a Disease.— The writer has long maintained that the classification and description of neurasthenia

in our medical text-books as a distinct malady, and its general treatment upon this basis, by physicians, is wholly unscientific and erroneous. Neurasthenia is a condition which is indicated by a special group of symptoms, and must itself be regarded as symptomatic rather than a pathological entity requiring a therapeutic agency to be immediately addressed to it.

Referring to a form of neurasthenia due to albuminuria, Dr. Pierre Marie, in a recent lecture delivered at the Hotel Dieu, Paris (*Medical Week*), very wisely remarked as follows: —

"The average medical man is apt to be content with appearances, and announces to his patient in a reassuring tone that it is nothing but a simple neurasthenia, which a few douches will quickly dispose of. In reality, however, he makes a grave mistake in forgetting that neurasthenia is not a disease, but a condition of the nervous system which may be the result of the most varied causes. Neurasthenia without any other qualification is not a diagnosis; for, as I have repeatedly stated, it is necessary also to indicate the determining cause. There may be neurasthenia by mental depression, excessive brain work, disturbed nutrition (cancer, etc.), neurasthenia due to lesions of the nervous system or of visceral origin, etc. It is of very frequent occurrence in diabetes and albuminuria, and we are therefore in duty bound in a case of neurasthenia to examine the urine, more particularly for albumin."

This is a rational method of dealing with neurasthenia. The cause must be considered rather than the condition itself. Remove the cause, and the neurasthenia quickly disappears. Rational physicians are coming more and more to consider the patient rather than his disease, in the application of remedies. When the eye is focused too closely upon the malady of the patient, the best interests of the patient himself may be forgotten. The writer has known cases in which diseases have been cured to the actual detriment of the patient; as a skin disease by the prolonged administration of large doses of arsenic, resulting in albuminuria, or constipation by the continuous use of cathartics or laxative mineral waters, to the total destruction of the patient's digestion.

"Neurasthenia" is a splendid term for hiding ignorance. Without some qualification, it is a word which never should appear as a diagnosis in a physician's case-book.

The Unwisdom of Hypnotism.— We agree with Dr. Hart, of the *British Medical Journal*, that the hypnotic state is a pathological condition. Hypnotism succeeds well only in certain susceptible persons.

While observing the experiments of Professor Charcot at the Hospital Salpêtrière, we noted that those persons who were really good subjects for hypnotism, and whom the professor brought before the class for demonstration, were evidently persons of weak mental constitution,— persons whose volitionary powers were deficient. Hypnotism is a complete success only when the subject has received a certain mental training whereby his volitionary control is still further reduced, and he is brought into a state in which he becomes more and more subject to impulses, and possessing less and less inhibitory power as he becomes a better subject for hypnotic influence.

The class of persons who are susceptible to benefit by suggestion through hypnotism are the very ones who need to have the will strengthened, and to be taught to apply a greater power of control over their impulses, rather than the reverse; hence the influence of hypnotism must be decidedly damaging, weakening the will, and aggravating the pathological condition which already exists.

All the real good that can be accomplished by hypnotism may be brought about by mental therapeutics, or rational psychological treatment without hypnotism. A course of mental training whereby the will may be strengthened, volitionary power increased, ability to suppress impulses developed, and the general health and vigor improved, will accomplish, in every case, all that can be done by hypnotism, and far more.

In the writer's opinion there is no place for hypnotism in scientific thera peutics.

Eating When Fatigued.— Every one should know that to eat when tired is to place upon the digestive organs a burden which they are wholly unable to carry. When the body is in a state of fatigue, the digestive organs are unable to perform their natural functions; the glands of the stomach will not form gastric juice; the saliva is deficient in quantity; and the whole digestive apparatus is incapable of doing efficient work. When exhausted, one should rest before eating. If a faint or "all-gone" sensation is experienced, relief may be obtained by drinking a glass of hot water or diluted fruit juice of some sort.

Horse Beef.— Within the last few years a new use has been found for worn-out street-car and cab horses. In former days these wretched animals were conveyed o the bone-yard or to a rendering establishment, where their hides were preserved for conversion into leather, their hoofs for glue and calves'-foot jelly, and their bones for fertilizers. The great surplus of horses, with their low prices, has recently given rise to a new method of disposing of these worn-out animals; and they are now served up, as in Paris, in the form of sausage, steaks, and roasts. There are two large establishments in the United States which are wholly devoted to slaughtering and packing horses. One of these is located in Portland, Ore.; and the other is near Chicago. The horses cost about $1.75 each. Horse beef is largely used by the men employed on the great drainage canal now under construction from Chicago, it being sold at about three cents a pound. Large quantities of this commodity are shipped to Antwerp, where it brings four cents a pound. It is also stated that horse flesh is freely used for saloon free lunches.

Enormous Doses of Subnitrate of Bismuth.— Mathieu recently reported a case in which the patient, who was suffering from hyperpepsia, took more than two ounces of subnitrate of bismuth daily for twenty-four days. The hyperpepsia was not materially benefited, but the patient suffered no other ill effects than a slight constipation and pigmentation of the skin, which disappeared when the drug was discontinued.

Music as a Hypnotic.— Beschinsky, a Russian physician, has reported remarkable results from the employment of music as a hypnotic. The remedy succeeded with both children and adults. The instrument employed was a piano.

Serum Treatment in Typhoid Fever.— Börger reports a case of typhoid fever treated by the serum of immunized sheep. No very tangible results were observed.

Photographing the Vocal Cords.— Experiments made by Professor Hallock in photographing the vocal cords have shown that the pitch is raised, not by increase in the tension of the cords, but by rotation of the arytenoid cartilages, whereby the cords are shortened.

A RECENT investigation of the herd of cows supplying the San Francisco almshouse with milk, showed thirty-one out of thirty-four cows to be affected with tuberculosis.

REVIEWS.

DIAGNOSIS AND TREATMENT OF DISEASES OF THE RECTUM, ANUS, AND CONTIGUOUS TEXTURES.— Designed for practitioners and students. By S. G. Grant, M. D., professor of diseases of the rectum and anus, University and Woman's Medical Colleges; lecturer on intestinal diseases in the Scarritt Training-School for Nurses; rectal and anal surgeon to All-Saints, German. Scarritt's Hospital for Women, and Kansas City, Fort Scott, and Memphis Railroad Hospitals, to East-Side Free Dispensary, and to Children's and Orphans' Home, Kansas City, Mo.; member of the American Medical Association, National Association of Railway Surgeons, the Mississippi Valley, the Missouri Valley, and the Missouri and Kansas State Medical Associations, etc.: with two chapters on "Cancer" and "Colotomy" by Herbert William Allingham, F. R. C. S., Eng., surgeon to the Great Northern Hospital; assistant surgeon to St. Mark's Hospital for Diseases of the Rectum; surgical tutor to St. George's Hospital, etc., London. One volume, royal octavo, 400 pages. Illustrated with 16 full-page chromo-lithographic plates and 115 wood-engravings in the text. Extra cloth, $3.50 net; half Russia, gilt top, $4.50 net. The F. A. Davis Co., publishers, 1914 and 1916 Cherry Street, Philadelphia; 117 W. Forty-second Street, New York; 9 Lakeside Building, Chicago.

This work is certainly worthy of high commendation. The author gives evidence of having had a large experience in the disorders of which the work treats, and we think most specialists who have had large experience in the treatment of rectal disorders will find little occasion to dissent from the positions taken by him. We do not, however, quite agree with his view of the Whitehead operation, an operation which is eminently successful when properly performed. We know of only one good operation for hemorrhoids, which this author seems to have overlooked; namely, the use of the snare and cautery. This method is decidedly preferable in a case of pedunculated hemorrhoids and polypi located high up in the rectum. The illustrations of the work are most excellent, and will be exceedingly helpful to the inexperienced surgeon.

In point of excellence of presswork, paper, binding, and particularly the handsome chromo-lithographic plates, it is unsurpassed among modern medical works, and its very moderate price renders it easily obtainable by every physician and student.

COLOR-VISION AND COLOR-BLINDNESS.— A Practical Manual for Railroad Surgeons. By J. Ellis Jennings, M. D. (Univ. Penna.), formerly clinical assistant to the Royal London Ophthalmic Hospital (Moorfields); lecturer on ophthalmoscopy and chief of the eye clinic in the Beaumont Hospital Medical College; ophthalmic and aural surgeon to the St. Louis Mullanphy and Methodist Deaconess Hospitals; consulting oculist to the Missouri, Kansas, and Texas railway system; fellow of the British Laryngological and Rhinological Association; secretary of the St. Louis Medical Society. Illustrated with one colored full-page plate and twenty-one photo-engravings. Crown octavo, 110 pages. Cloth, $1 net. Philadelphia: The F. A. Davis Co., publishers, 1914 and 1916 Cherry Street.

This little work gives complete information upon the subjects of which it treats, and is an exceedingly convenient manual, by the study of which any intelligent person may render himself competent to make a proper examination with reference to color-blindness. The subject of color-blindness is coming to be more and more generally recognized as an important one, and this work will be universally recognized as meeting a real want in the literature of medicine. Among the numerous useful medical works which are being brought before the profession by that enterprising publishing house, the F. A. Davis Company, there are very few which will prove of greater service and be more appreciated than this one.

SYPHILIS IN THE MIDDLE AGES AND IN MODERN TIMES.— By Dr. F. Buret, Paris, France. Translated from the French, with notes, by A. H. Ohmann-Dumesnil, M. D., professor of dermatology and syphilology in the Marion Sims College of Medicine; consulting dermatologist to the St. Louis City Hospital, to the St. Louis Female Hospital; physician for cutaneous diseases to the Alexian Brothers' Hospital; dermatologist to Pius Hospital, to the Rebekah Hospital, to the St. Louis Polyclinic and Emergency Hospital, etc. This work comprises Volumes II and III of "Syphilis To-day and Among the Ancients," complete in three volumes. 12mo., 300 pages. Extra cloth, $1.50 net. Philadelphia: The F. A. Davis Co., publishers, 1914 and 1916 Cherry Street.

This work contains much that is interesting and curious. The author has certainly been indefatigable in researches in relation to his subject; but we are in greater need of literature whereby men may be taught how to keep themselves pure than of books which suggest that the authors must have run a muck rake through all the libraries of the past to find material for filling them. The book is not without value to the specialist in disorders of this sort, but we really cannot imagine how any good can come from its general circulation even in the medical profession, and, unfortunately, its circulation will not be confined to practitioners of medicine.

ESSENTIAL LESSONS IN HUMAN PHYSIOLOGY AND HYGIENE FOR SCHOOLS.— By W. E. Baldwin, M. D. The Werner School Book Company, Chicago, Ill.

This work of about 200 pages is printed on good paper and in clear type, and is well adapted to the purpose for which it is designed,— that of a school text-book. The subject-matter is clearly and concisely presented, and the alcohol and tobacco questions receive due attention. We are glad to note that the author takes a decided stand against the popular theory that alcohol somehow serves a useful purpose as a food. The work is a good one.

THE HIGHER CRITICS CRITICIZED.— By Rufus P. Stebbins, D. D., and Rev. H. L. Hastings. Published by H. L. Hastings, 47 and 49 Cornhill, Boston, Mass.

So much has been said and written within recent years about the "higher criticism," that a work of the character of the one before us is certainly timely. The very term "higher criticism" enjoys to such an extent the advantage of scholarly authority that its mere mention is sufficient to cause a great number of people instantly to take off their hats and make a very low obeisance, metaphorically speaking, and to accept, almost without question, the conclusions to which these "higher critics" have arrived, no matter how much at variance they may be with the generally accepted views of Holy Writ, or what might be termed the common-sense interpretation of its language. The general tendency of the so-called "higher criticism" has certainly been to undermine faith in the authority of the Bible as a spiritual guide. Convince a boy that his mother's word is not to be relied upon at all times and under all circumstances, and you have destroyed, altogether, that mother's influence over her son, except so far as it may be exercised by force. The "higher critics" have long employed themselves most diligently as iconoclasts, and have certainly accomplished much in tearing down old-fashioned faith and confidence in the word of God; but what have they given us in place of that which they have destroyed? The authors of this work bring the "higher critics" to judgment in a masterly way. The work is destined to be the means of accomplishing great good, and ought to have a wide circulation.

ELEMENTARY TECHNIQUE IN HISTOLOGY AND BACTERIOLOGY.— By Ernest B. Hoag, A. B., B. S., and H. Kahn, Phar. M. E. H. Colegrove & Co., Chicago.

This little work of 130 pages contains more exact, definite, and lucid information than any treatise on bacteriology which has been brought to our notice. The work seems to be in every way thorough and satisfactory, and as complete as could be desired for a work of the kind.

ELECTRICITY AND ELECTROTHERAPEUTICS.— By E. J. Houston, Ph. D., and A. E. Kennelly, Sc. D. The W. J. Johnston Co., New York.

This work presents to the electrotherapeutist what has heretofore been lacking,— a treatise in which is found summed up and presented in an admirably lucid manner the whole subject of electrophysics as related to therapeutics. Every physician, before undertaking to apply electricity therapeutically, unless already thoroughly posted in the physics of electricity, should obtain a copy of this work and master it. The work is not only technically correct in physique, but interesting as well. It is fortunate for the profession that two gentlemen so eminent in electrophysics should have taken the trouble to prepare a handbook of this kind. The book is brought out in excellent shape by the publishers, the W. J. Johnston Co., and constitutes one of the numbers of a series of elementary technical works comprising the various uses of electricity in heating, telegraphing, lighting, running of machinery, etc.

PREGNANCY, LABOR, AND THE PUERPERAL STATE.— By Egbert H. Grandin, M. D., consulting surgeon to the New York Maternity Hospital; consulting gynecologist to the French Hospital, N. Y., etc.; and George W. Jarman, M. D., obstetric surgeon to the New York Maternity Hospital; gynecologist to the Cancer Hospital, N. Y., etc. Illustrated with forty-one (41) original full-page photographic plates from nature. Royal octavo. Cloth, $2.50 net. Philadelphia: The F. A. Davis Co., Publishers, 1914 and 1916 Cherry Street.

Drs. Grandin and Jarman, the authors of this excellent treatise, have brought to their work an ample and well-digested experience, and have produced a volume which is, in many respects, unique. From a practical standpoint it is altogether the best work of the kind which has ever appeared. The excellent half-tone illustrations instantly impart through the eye information which could scarcely be communicated by a simple description, and thus render the work indispensable to all who wish to be up with the times in respect to the subjects treated. The paper and presswork are excellent. The publishers as well as the authors are to be congratulated on producing so useful and handsome a volume.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
GEO. H. HEALD, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, B. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

AN EASY METHOD FOR DETERMINING THE CAPACITY OF THE STOMACH AND THE AMOUNT OF RESIDUAL CONTENTS.

BY J. H. KELLOGG, M. D.

PHYSICIANS who have undertaken to make an exact study of the morbid conditions of the stomach by the aid of ordinary means of inquiry have long desired some way of determining accurately the size of the stomach and the degree of motor efficiency, or ability to empty itself of its fluid. Several methods have been devised by which the lower border of the stomach can be pretty accurately located, but it has heretofore been impossible to determine with any considerable degree of accuracy whether the descensus of the stomach is due, in a given case, to prolapsus of the organ or to dilatation.

A line of thought and experimentation started by an idea received from a French writer some months since has enabled me to develop what I believe to be an exact method for determining the volume of the fluid contents of the stomach a any given time, and also the actual capacity of the stomach in a given case. The test should be made with the patient fasting if the capacity of the stomach is the chief object of the examination. The requisites for the procedure are as follows : —

1. Two reservoirs, holding about two liters each, one of which should be graduated, both connected by a rubber tube and a Y connection with a stomach-tube of moderate size.

2. Half a liter of a solution of sodium iodide, containing about .020 grams of the iodide (Na I) in each 100 c. c.

3. Two or three liters of distilled water, and a graduated beaker for measuring the same.

Everything being in readiness, proceed as follows : —

1. Have the patient swallow 200 c. c. of the standard iodide solution. Have the patient agitate the diaphragm for thirty seconds, so as to mix the iodide solution with the stomach contents.

2. Withdraw from the stomach with the stomach-tube, a portion of its contents (50 to 100 c.c.). Place this solution in a glass marked A.

3. Retaining the stomach-tube in place, pass into the stomach from the graduated reservoir distilled water sufficient to fill the stomach, holding the reservoir at the height of the shoulder. Carefully note the amount. The stomach should be considered filled when the fluid ceases to flow from the reservoir. No attempt should be made to force more into the stomach by raising the reservoir, as this will result in forcing the fluid out along the side of the tube, or down into the lower intestine. When the stomach is filled, shut off the tube leading to the graduated reservoir, and pass the fluid out of the stomach by opening the stop-cock leading to the other reservoir. Pass the fluid out and in the reservoir two or three times by alternately lowering and raising it. This should not occupy more than two minutes. Withdraw 300 to 400 c.c. of fluid, placing it in a glass marked B, the amount to be carefully measured later.

4. Pass into the stomach 200 c. c. of the standard iodide solution or water. Pass out and in the stomach two or three times, then remove as much of the stomach fluid as can be conveniently withdrawn, and place in a glass marked C.

5. Determine the amount of iodine contained in each of the glasses, A, B, and C. By comparison with each other

and with the first solution and the quantities of standard iodide solution and distilled water introduced into the stomach, the quantities sought will be obtained.

QUANTITIES AND FORMULÆ.

r equals 200 c. c. of sodium of iodide solution.

q equals amount of distilled water required to fill the stomach.

a equals first portion of fluid removed from the stomach.

b equals second portion of fluid removed from the stomach.

c equals third portion of fluid removed from the stomach.

n equals amount of iodine in each 100 c. c. of the standard iodide solution.

n' equals iodine in 100 c. c. of a.

n'' equals iodine in 100 c. c. of b.

n''' equals iodine in 100 c. c. of c.

x equals the amount of fluid contained in the stomach at the beginning of the experiment.

y equals the capacity of the stomach.

FORMULÆ.

$$\frac{n \times r}{n'} - r = x, \text{ contents in cubic centimeters.}$$

(1) $$\frac{n \times r}{n'} - a + q = y, \text{ capacity in cubic centimeters.}$$

(2) $$\frac{n \times r}{n''' - n''} - r + b = y, \text{ the capacity of the stomach.}$$

A little study of the above formulæ will make very clear the principle upon which this method rests. In the formula for obtaining x (the residual contents of the stomach), we multiply the number of milligrams per 100 c. c. contained in the standard solution (20), by the quantity of the solution introduced (200), and divide the result by the number of milligrams of iodine found in a, the first portion of fluid removed from the stomach after the addition of 200 c. c. of the standard iodide solution. (Of course any other desired quantities could be used, provided the quantity of iodide of sodium employed is sufficient for accurate estimation.) From the result obtained, we must subtract r, the amount of standard solution introduced (200 c. c.), to give x, the amount of fluid contained in the stomach at the beginning of the experiment. Placing the known quantities in place of n and r, the formula will stand as follows: —

$$\frac{20 \times 200}{n'} - 200 = x, \text{ contents of stomach.}$$

Now, by the addition of a sufficient quantity of water to fill the stomach, we have data by comparison of which may be estimated the capacity of the stomach. The fraction $\frac{n \times r}{n'}$, $\left(\frac{20 \times 200}{n'}\right)$, gives us the contents of the stomach before the first sample of fluid (a) was removed. Subtracting a and adding q, the quantity of water required to fill the stomach, gives us y, the capacity of the stomach in cubic centimeters. This operation is represented in formula 1.

Now, removing a quantity (b) of the fluid contained in the filled stomach, and replacing it by 200 c. c. of the iodide solution (r), and then removing another sample of the stomach contents (c) and comparing the amount of iodine found in this second dilution with that found before, we have the means of determining the amount of fluid left in the stomach after the withdrawal of the second portion of fluid, b. By carefully measuring b and adding to it the quantity left behind, as determined by comparison of the amount of iodine contained in the portions b and c, we have a second means for determining y, the capacity of the stomach. This operation is expressed in formula 2.

We thus have two different methods of determining the capacity of the stom-

ach. The first depends upon the estimation of the contents of the partially filled stomach and the measurement of the amount of fluid required to fill the stomach. Adding these two amounts together gives the stomach capacity. The second method depends upon the estimation of the stomach contents after the stomach has been filled and a portion withdrawn, care being taken to measure the portion withdrawn. Then, by adding the amount determined for the stomach contents to the amount withdrawn from the stomach, we have a second determination of the capacity of the stomach. There is, of course, an element of error in the first method, in the fact that some portion of the fluid passed into the stomach may escape into the intestine. The second method, however, is practically free from this objection. By comparison of the results obtained by the two methods, we have the means of determining whether the pylorus is well closed, or whether it is relaxed.

In the following case the close approximation of the two quantities found for y show not only the accuracy of the method, but also the fact that, in this particular case at least, the pylorus was well closed, and did not, at least within the time occupied by the procedure (which was only six minutes), discharge any of its contents into the intestine. The subject, a young man of about twenty-two years of age, was apparently in good health, and did not suffer from indigestion, and gave no evidence of any abnormal condition whatever pertaining to the stomach. The test was made by one of my laboratory assistants, a student of medicine, July 21, 1896, in the morning, before the patient had taken either food or drink, and the following figures were obtained: —

$r = 200$ c. c.
$q = 1800$ c. c.
$a = 70$ c. c.
$b = 188$ c. c.
$c = 175$ c. c.

$n = 14.5$ c. c. (burette reading) or .0493 gms. I.
$n' = 11.5$ c. c. " " or .0391 " "
$n'' = 1.1$ c. c. " " or .00374 " "
$n''' = 1.$ c. c. " " or .0034 " "

$$\frac{14.5 \times 200}{11.5} - 200 = 52.1 \text{ (x)}$$

$$\frac{14.5 \times 200}{11.5} - 70 + 1800 = 1982.1 \text{ (y)}$$

$$\frac{1 \times 200}{1.1 - 1} - 200 + 188 = 1988. \text{ (y)}$$

$x = 52.1$ c. c. residual contents.
(1) $y = 1982.1$ c. c. capacity.
(3) $y = 1988$ c. c. capacity.
Time, six minutes.

It will be noted that the difference in the stomach capacity as determined by the first and second formulæ is but 6 c. c., or one fifth of an ounce, an amount of error not worth noting. The contents of the stomach in this case was practically two liters.

Several precautions must be observed in the employment of this method: —

1. The operation must be done quickly, the time occupied not being over four to six minutes. With everything in readiness, this gives ample time for the entire procedure.

2. The patient should be somewhat accustomed to the use of the stomach-tube by previously passing it a few times, so that gagging and retching from fear and nervousness may be eliminated.

3. The temperature of the solution should be that of the body, to avoid stimulating muscular movements on the part of the stomach.

4. The chemical estimations should be made with extreme accuracy. Indeed, the whole procedure must be executed with great precision, accuracy, and celerity.

5. Care must be taken to eliminate air or gas in the stomach as a source of error. By carefully passing the stomach-tube for withdrawal of the first portion, *a*, whatever gas there may be in the stomach will escape as soon as the tube enters the organ. A few seconds should be allowed for this, then the tube passed farther in, and a portion of the contents si-

phoned out. While the tube is full and the siphoning in progress, the tube should be pinched, then the connection should be quickly made with the injecting apparatus, the same having been previously adjusted so that the tubes will be completely filled with water. By exercising due care, no air will be forced into the stomach.

I am collecting data, by making a series of estimations of the capacity of the stomach in a sufficient number of healthy individuals to enable me to find the average size of the healthy stomach. The size of the stomach will, of course, naturally differ with the size of the individual; hence, for fair comparison, it will be necessary to determine the proper stomach capacity for individuals of different heights and to establish a stomach-capacity-height coefficient.

From the observations thus far made, I believe that the capacity of the healthy stomach should be about 1 c. c. for each millimeter of height. The height rather than the weight should be chosen as the standard for comparison; for the height is a fixed quantity in the adult individual, while the weight is constantly varying. I therefore propose for the coefficient of stomach capacity the unit obtained by dividing the stomach capacity in cubic centimeters by the height in millimeters. This gives for the case the details of which are given above, a stomach-capacity coefficient of 1.25.

In another case, that of a healthy young man aged twenty-seven years, height sixty-seven inches, the following figures were found: —

Residual contents (x), 32 c. c.

Capacity of the stomach, as determined by the first formula (y [1]), 2007 c. c.

Capacity of the stomach as determined by the second formula (y [3]), 1940 c. c.

In this case it appears probable that a small amount of fluid, 67 c. c., or a little more than two ounces, escaped from the stomach through the pylorus during the procedure.

In practise it is found that the addition of distilled water, as required by formula 3, produces so diluted a solution of iodine that it is difficult to estimate the amount accurately. On this account it is better to use the standard solution of iodide of soda, as required in formula 2, for the determination of y for the stomach capacity.

As a means of determining the limit of accuracy of this method, I have had my assistant apply it to two flasks, one of which contained an unknown quantity of fluid, the other, an unknown quantity of distilled water. The results were as follows: —

Flask I.

r = 200 c. c.
s = 200 c. c.
q = 1930 c c.
a = 86 c. c.
b = 291 c. c.
c = 219 c. c.
n = .0765 gms. iodine.
n' = .068 " "
n'' = .00595 " "
n''' = .0134 " "
x = 25 c. c., contents; actual contents, 25 c. c.
(1) y = 2069, capacity; actual capacity, 2078 c. c. — 9 c. c.
(2) y = 2091 capacity; actual capacity + 13 c. c.

As will be noticed, the method determined with absolute accuracy the contents of the flask which, together with its capacity was unknown to the experimenter until after the procedure was completed. The first formula for y gives the capacity for a two-liter flask as 9 c. c., or a little more than two drams, less than the actual capacity. The determination of y by the second formula gives a capacity of 13 c. c., or three drams too large.

From these figures it is apparent that the method is amply accurate for practical purposes, and that it affords a method whereby it is possible to determine with certainty between prolapse and dilatation of the stomach, and to measure

the degree of variation in the size of the stomach in either direction.

By the same method it is possible to determine the rate at which fluid leaves the stomach after its introduction, and other facts respecting the motor activity of the stomach,—a line of investigation which I am pursuing with much interest.

REPORT OF EXAMINATION OF BLOOD.

FOR JUNE.

Blood Count.	Men.	Women.	Total.
Over 5,000,000	19	0	19
Between 4,500,000 and 5,000,000	37	15	52
" 4,000,000 " 4,500,000	16	49	65
" 3,500,000 " 4,000,000	1	8	9
" 3,000,000 " 3,500,000	2	2	4
Totals	75	74	149

Hemoglobin.	Men.	Women.	Total.
100 per cent.	34	13	37
93 " "	40	49	89
86 " "	3	13	16
78 " "	3	1	4
71 " "	1	0	1
63 " "	1	1	2
Totals	72	77	149

Gastric Laboratory Report for June.— Regular chemical analysis of the stomach fluid was made in 157 cases; experimental analyses, 26.

The cases were from the following States and countries: From Michigan, 58; Ohio, 22; Indiana, 2; Illinois, 14; Texas, 9; Minnesota, 7; Pennsylvania, 6; New York, 4; Iowa, 3; Missouri, 3; Nebraska, 3; Kentucky, 2; Tennessee, 2; Montana, 2; Wisconsin, 2; Massachusetts, 1; Louisiana, 1; Alabama, 1; Arizona, 1; Connecticut, 1; Ontario, 2; England, 1. Total, 157.

Microscopical Examination of Sputum for June.— Number of examinations made, 42; new cases, 32; number of specimens in which tubercle bacilli were found, 14.

Tubercular germs were found in 8 cases, from the following States: Michigan, 3; Missouri, 1; Virginia, 1; Ohio, 1; Illinois, 1; Canada, 1.

Urinary Laboratory Report for June.—Number of specimens examined, 329; number of cases, 253. Number of specimens in which albumin was found, 19; pus, 67; blood, 3; sugar, 5; bile, 7; casts, 3. Number of specimens examined for toxicity, 22; number of cases, 19.

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THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.— The Sixth Annual Meeting of the American Electro-Therapeutic Association will be held on Tuesday and Wednesday, Sept. 29 and 30, and Thursday, Oct. 1, 1896, in Allston Hall, the Studio Building, Clarendon Street, near St. James Avenue, Boston, Mass.

The Brunswick Hotel, corner Boylston and Clarendon Streets, will be the headquarters of the Association during the meeting. Terms reduced to four dollars per day for Fellows and their friends. The Copley Square Hotel, corner Exeter Street and Huntington Avenue, terms reduced to three dollars per day, is also located in close proximity. For rooms, etc , apply either to the proprietors, or to Dr. W. H. White, No. 222 Marlborough Street, Boston, Mass., who, as the Vice-Chairman of the Committee of Arrangements, will reserve rooms.

Professor A. E. Dolbear, Tufts' College, Mass., is the Chairman of the Committee of Arrangements.

Dr. W. H. White, 222 Marlborough Street, Boston, Mass., is the Vice-Chairman of the Committee of Arrangements.

Dr. Frederick H. Morse, Melrose, Mass., is the Chairman of the Committee of Exhibition.

The next annual meeting promises to be a greater success than any former one. Great interest is shown in all quarters ; a large attendance is promised. Many candidates of national reputation are proposed for membership, so that the amendment to increase the limit of members becomes a necessity. The best talent has already announced papers, a larger number than ever before, at this early date,—material almost sufficient to make a program for the session of unusual interest. There will be two discussions of importance in electro-therapeutics, interesting reports of all standing committees, several scientific lectures on the first evening, with demonstrations and stereoscopic views (including the Roentgen X-Rays, and electric principles in the treatment of diseases), given by eminent talent.

The Committee of Arrangements has surprises in store for the social element in receptions and excursions.

The exhibition promises to be a good feature, and of more than usual interest.

The fifth annual volume of "The Transactions of the American Electro-Therapeutic Association" is now on press, and will be ready for delivery about the end of July, 1896; illustrated, cloth bound, gilt lettering, octavo, about three hundred pages.

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CHICAGO SANITARIUM,

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THIS institution is a branch of the Battle Creek (Mich.) Sanitarium. It is favorably located near Lake Michigan, in the southern portion of the city, close to Cottage Grove avenue, and facing the old Baptist University grounds. A few patients are accommodated. Facilities are afforded for hydrotherapy, and the application of massage, electricity, Swedish movements, and other rational measures of treatment.

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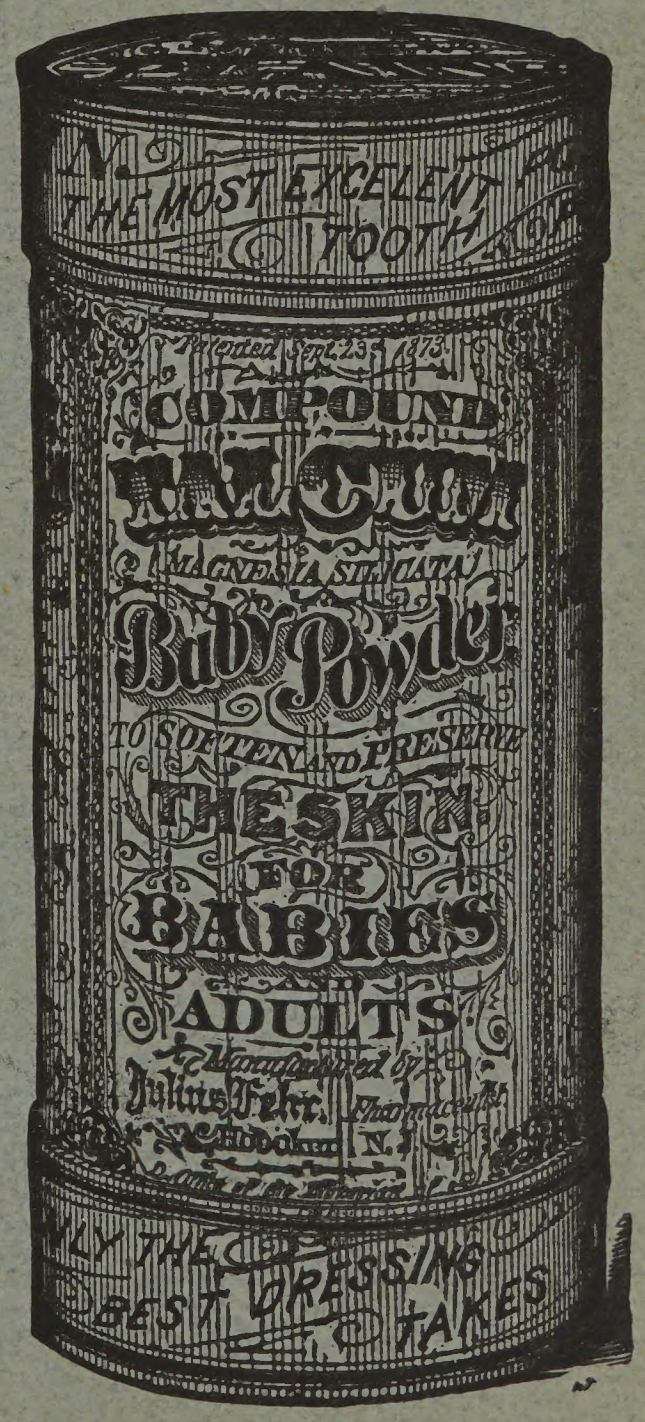

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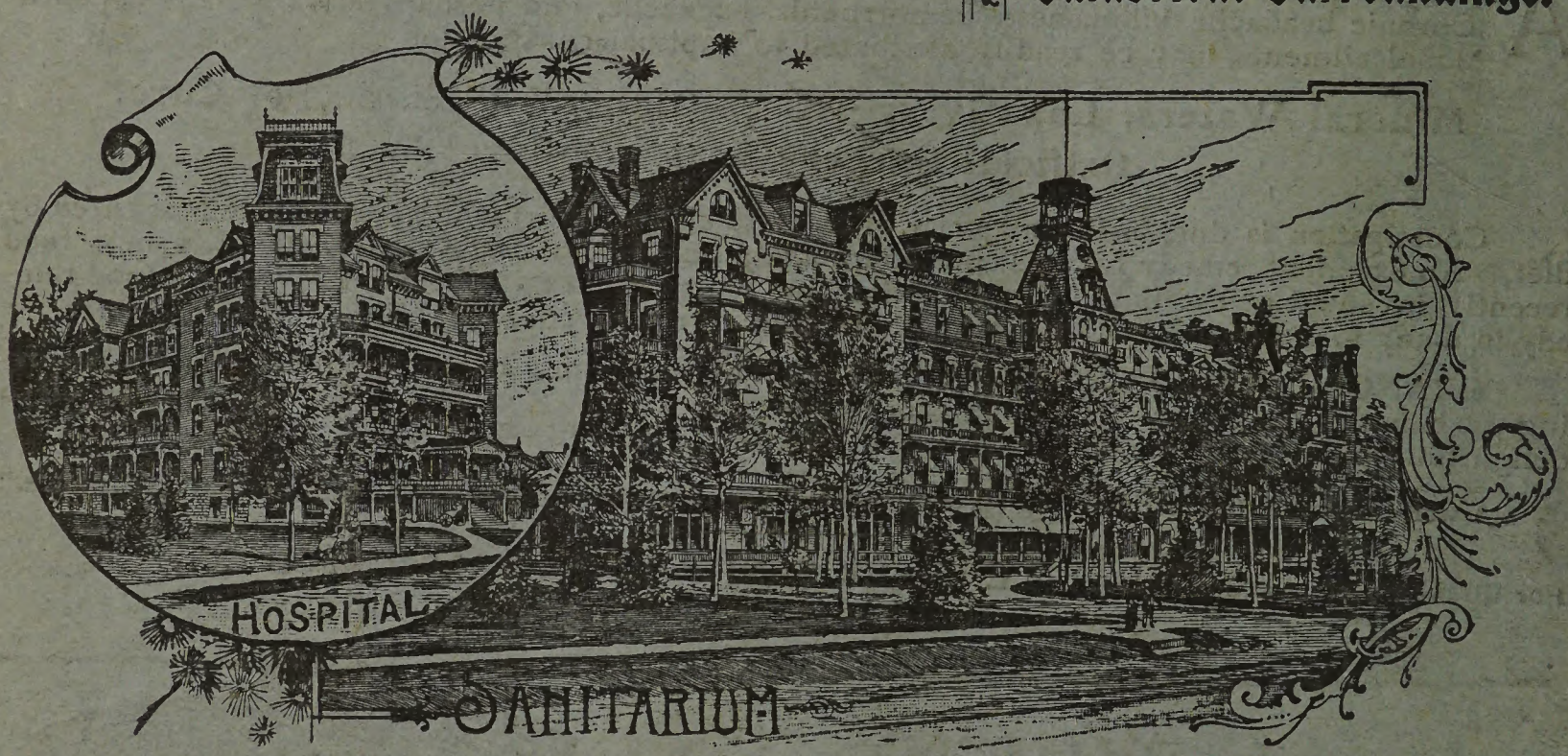

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